News of the Industry Begins Page 278

AUG 26 1929

AUTOMOTIVE INDUSTRIES

Volume 61
Number 8

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, AUGUST 24, 1929

35c a copy
$3.00 a year

TWO MORE CARS
BIJUR EQUIPPED!

ON ALL
SAFETY STUTZ
and
BLACKHAWK MODELS

BIJUR

Chassis Lubrication

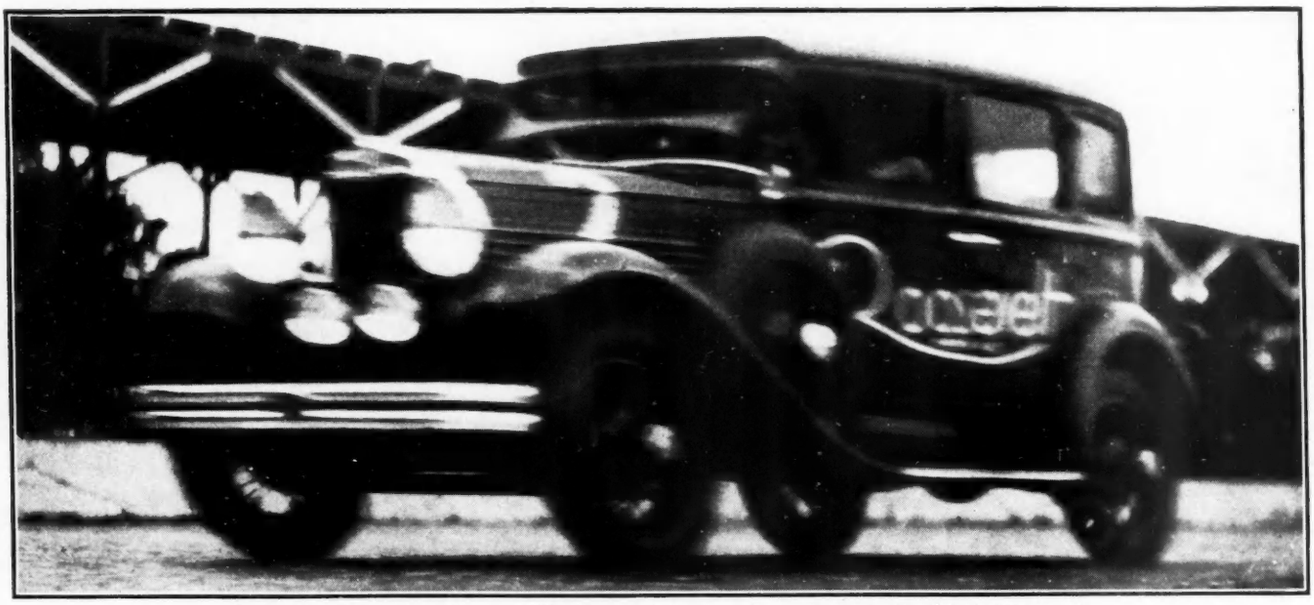
BIJUR LUBRICATING CORPORATION, NEW YORK

Originators of Modern Chassis Lubrication

Entered as second-class matter Oct. 1, 1925, at the post office at Philadelphia, Pa., under the Act of March 3, 1879

Federal-Mogul Equipped Roosevelt 8 Sets New Auto Non-Stop Endurance Record

440 Hours—Over 18 Days without a Single Stop



Federal-Mogul equipped Roosevelt 8 flashing past stands on famous Indianapolis 2½-mile brick track.

Mogul FEDERAL

THE COMPLETE FEDERAL-MOGUL LINE

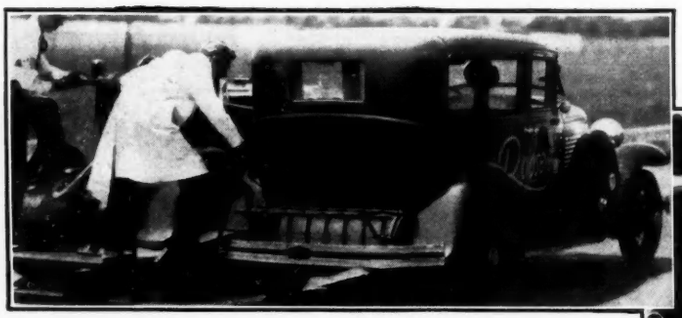
Zinc, Aluminum, and Tin Base Alloy Die Castings
Bronze-Back, Babbitt-Lined Bearings
Die-Cast Babbitt Bearings and Bushings
Bronze Bushings and Bronze Washers
Bronze Castings
Bronze Cored and Solid Bars
Babbitt Metals

Licensed under Letters Patent of the United States Nos. 1,455,939; 1,302,584; 1,302,838; 1,340,337

The non-motor stop, non-wheel stop endurance record of 440 hours and 30 minutes, established by a Roosevelt straight-eight on the Indianapolis Speedway, provides new and official proof of the dependability of Federal-Mogul Bearings and Bushings.

The record-breaking Roosevelt was a stock sedan, using both Federal-Mogul Bronze-Back Babbitt-Lined Bearings and Bronze Bushings as standard equipment. Equipment included two extra wire wheels, tires, tubes and covers, bumpers front and rear, shock absorbers, and trunk rack. It was selected at random from the assembly line in the Marmon-Roosevelt factory by A.A.A. representatives, under whose official observation the test was conducted. The record is subject to official certification.

Over 100 leading automotive manufacturers are exercising the same sound judgment as Marmon and Roosevelt in turning to Federal-Mogul for dependable bearings—bearings that meet the strictest standards of lasting service and smooth, reliable performance.



Above, a close-up of a refueling operation during the Roosevelt non-stop endurance run which broke all previous records for sustained automotive operation on the Indianapolis Motor Speedway.

Right, a "mother" car was used as a traveling base of operations during the record-breaking non-stop endurance run of the Federal-Mogul Bearing equipped Roosevelt 8 on the Indianapolis Speedway. The method of changing drivers is shown on the right.

FEDERAL-MOGUL CORPORATION
DETROIT - - - MICHIGAN

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.
Established 1902

Vol. 61 No. 8

NORMAN G. SHIDLE, Directing Editor
LESLIE PEAT, News Editor
P. M. HELDT, Engineering Editor
HAROLD E. HILLMANN, Asst. Editor
EARL O. EWAN, Managing Editor
ATHEL F. DENHAM, Field Editor
M. WARREN BAKER, Field Editor
HAROLD M. BAKER, Detroit News Rep.
A. B. CROFOOT, N. Y. News Rep.

Contents

Earnings Fail to Match Production in First Six Months of 1929. By Earl O. Ewan..... 253

Morris Motors, Ltd., Isis Six Has All-Steel Sedan Body. By M. W. Bourdon..... 255

Manufacture of Front Wheel Drive Cord Automobile Entailed Only Minor Production Changes. By Athel F. Denham..... 256

Studebaker Offers Delivery Wagons in Thirteen Body Combinations 259

Gemmer Pneumatic Shock Absorber Resembles Double-Acting Pump 261

New-Way Two-Cylinder Engine is Air-Cooled Farm Type 263

Just Among Ourselves 265

World Census of Automobiles (Estimated) Jan. 1, 1929 266

J. I. Case Co. Announces New Model L Four-Plow Tractor With Engine Arranged Longitudinally. By P. M. Heldt 268

Forum—Moskovics Replies to Rickenbacker on New Race Rules for Indianapolis..... 271

New Developments 274

News of the Industry 278

Men of the Industry 282

Financial Notes 283

Calendar of Events 288

Advertisers' Index 108, 109

Automotive Industries is published every Saturday by
CHILTON CLASS JOURNAL COMPANY
Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager
J. S. HILDRETH, Vice-Pres. and Director of Sales
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.
A. H. VAUX, Secretary and Treasurer
JOHN A. CLEMENTS, Ass't Treasurer

JULIAN CHASE, Business Manager
Automotive Industries
GEO. D. ROBERTS
Advertising Manager

Cable Address.....Autoland, Philadelphia
Telephone .....Sherwood 1424.

OFFICES

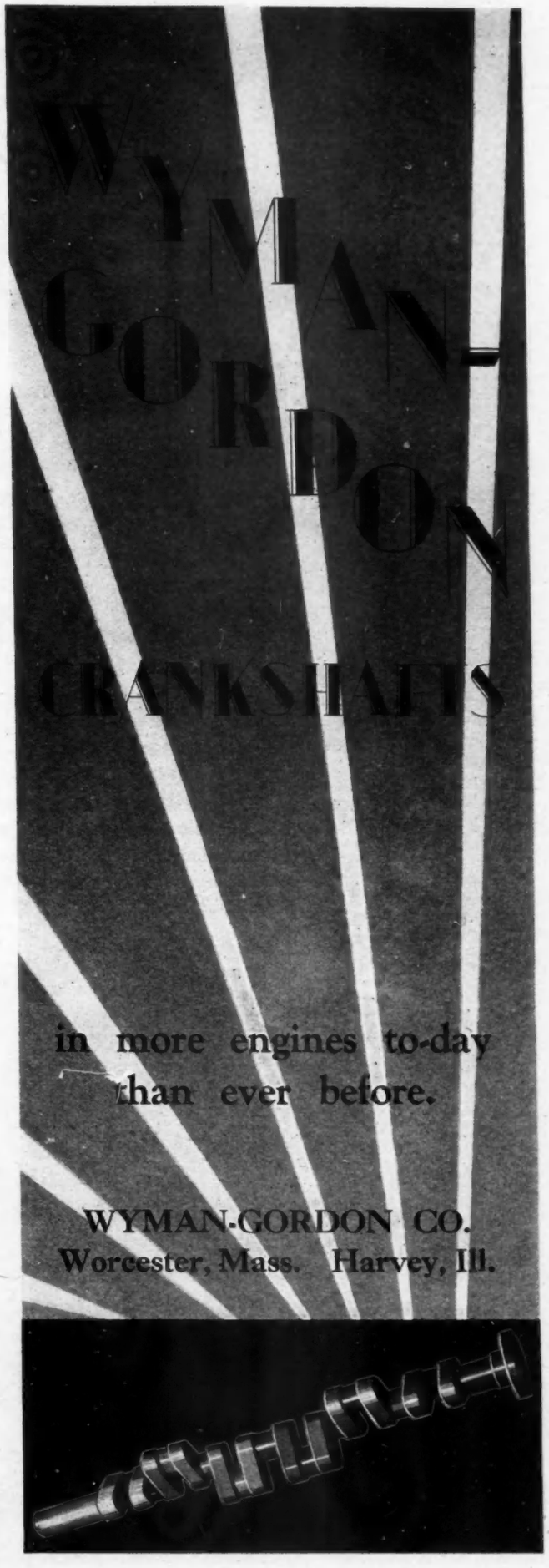
New York—U. P. C. Bldg., 239 W. 39th St., Phone Pennsylvania 0080
Chicago—5 South Wabash Ave., Phone Central 7045
Detroit—710 Stephenson Bldg., Phone Northway 2090
Cleveland—1140 Guardian Bldg., Phone Main 6860
Los Angeles—433 Petroleum Securities Bldg., Phone Westmore 9084

Controlled by United Business Publishers Inc., 239 West 39th Street, New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

SUBSCRIPTION RATES: United States, Mexico, United States Possessions, Canada and all countries in Postal Union, $3.00 per year; Foreign, $6.00 per year Single Copies 35c.

COPYRIGHT, 1929, CHILTON CLASS JOURNAL COMPANY
Member of the Audit Bureau of Circulations
Member Associated Business Papers, Inc.

Automotive Industries — The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.

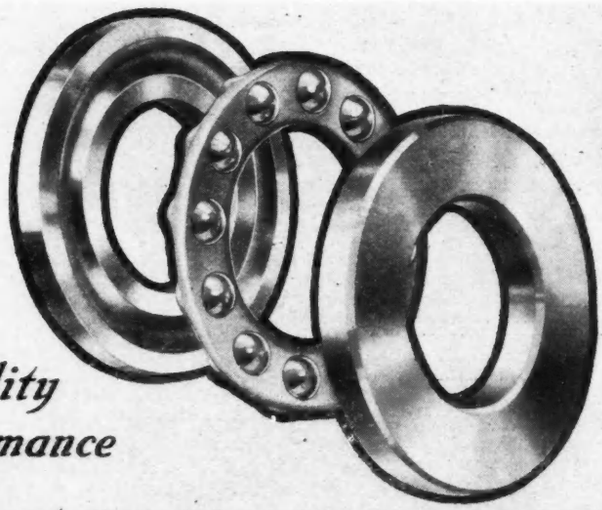


AETNA

THRUST
BALL
BEARINGS

Millions of cars on the open road. Higher speeds —quicker turns—week-end traffic jams. Millions of cars on the city streets. Clashing gears—sudden stops —stalled motors. Out and in goes the clutch—hundreds of times a day. Will it squeak and squeal—chatter and chirp—or will its friction-free performance make life easier for the driver?

Modern clutches are made for hard service. Aetna Thrust Ball Bearings are made for hard service. Is it any wonder that clutch and car manufacturers both specify Aetna Bearings—made by thrust bearing specialists?



High in Quality & Performance

AETNA BALL BEARING MFG. CO.
4600 SCHUBERT AVENUE
CHICAGO, ILLINOIS

AUTOMOTIVE INDUSTRIES

VOLUME 61 *Philadelphia, Saturday, August 24, 1929* NUMBER 8

Earnings Fail to Match Production in First Six *Months of 1929*

Incomes of ten representative passenger car manufacturers for the first half of this year did not keep pace with new records in output. Outlook favorable.

By EARL O. EWAN

UNPEERED automobile production cannot be presumed to assure unprecedented profits, judging from the output and income reports of 10 representative passenger car companies in the industry for the first six months of 1929. The list does not include, however, that champion producer, the Ford Motor Co., since its financial data are available only in the spring of each year when it is required to file a statement of earnings in Massachusetts to retain the privilege of transacting business in that state.

Outstanding among the organizations considered is the General Motors Corp., whose companies turned out in the first six months of this year 979,860 units as against the 916,000 credited to the Ford assembly lines. Earnings of the corporation for the first six months, as has been announced, were $151,860,310 as compared with $161,267,974 for the corresponding period a year ago. That shows a decrease in income of 6 per cent, which is partly responsible for the 10 representative companies listed in the accompanying table realizing a total increase in earnings of only 1.4 per cent in the first six months over those of the same period last year. Aggregate earnings of the 10 companies, including General Motors, for the first six months of this year were $206,586,527 as against $203,732,321 for the same period a year ago. Exclusive of General Motors, however, the earnings of the companies considered totaled $42,464,347 for the first six months of last year and for the same period of this year, $54,726,217, an increase of 29 per cent.

Production in the first six months of this year of the 10 concerns was 1,446,610 of the 3,411,451 units turned out in that period by the entire industry, or 42 per cent. Exclusive of General Motors, the companies produced 466,750 automobiles in the first six months of 1929, or 14 per cent of the entire output for the half year. General Motors production is 67 per cent of the total of the 10 companies for the first six months of 1929, and 28 per cent of the aggregate for the half year. The total production of the industry for the first six months of 1928 was 2,326,509 vehicles.

It is now being forecast in certain quarters that the production month by month for the remainder

First Half-Year Earnings

Half-Year Earnings of Ten Representative Passenger Car Manufacturers

	First Six Months of 1928	First Six Months of 1929	Net Change %
Chrysler	$11,690,479	$18,095,239	39
General Motors	161,267,974	151,860,310	—6
Hudson-Essex	9,216,321	10,621,512	15
Hupp	4,283,220	2,831,382	—33
Jordan	473,372	151,138	—68
Nash	5,732,851	10,742,199	86
Peerless	—161,116	—597,528	..
Pierce-Arrow	—642,220	1,737,175	..
Reo	3,018,144	1,686,358	—44
Studebaker	8,853,296	9,457,742	6

of the year will continue to exceed that of 1928 and establish new records. A long stride in that direction was taken in July when 500,000 units were turned out by the entire industry, exceeding the output for the same month of 1928 by 20 per cent. August production undoubtedly will exceed that of July and of August last year, since assembly lines have been operating this month at an increased rate over last month, chiefly as the result of the recent introduction of new models by several companies. It is not an uncommon opinion that the output this month will approximate 550,000 units. Both Ford and Chevrolet have been maintaining their high schedules, and in announcing its July domestic production as 180,804 units, the Ford Motor Co. let it be known that every effort would be made to meet the demand for 200,000 units this month. With the prospect of more new models being introduced in the second half of this year than in any similar period in the history of the industry, there has come upon the industry a certain assurance that the new cars will insure the continuance of the exceptional demand on the part of the public, both at home and abroad.

Recently it was stated in *The Annalist* relative to the July production figures that, "These figures seem to indicate rather clearly that the extraordinarily high selling rate of automobile units in the first half of the year has entered the second half also at an unusually high level. This fact does not of course guarantee this phenomenal level through the remainder of 1929; but it goes some way in weakening the probabilities of a marked decline."

Fall Forecast Favorable

Another report has said that from time to time various authorities have expressed the opinion that the automobile industry, in the second half of 1929, would suffer a rather drastic reduction in sales and profits. One of the reasons for the forecast, the report explained, was that the output would have to be curtailed materially as a result of the enormous output of the first six months. Recent estimates of fall business were said to have reflected a more optimistic attitude, however, the general feeling being that while some reduction in output will occur in the second half, in comparison with the first six months, the aggregate production will at least be on a par with that of the corresponding period of 1928 and possibly exceed it.

Another source stated that after a field investigation no valid basis was found for the belief held in certain quarters that the second half of 1929 will represent a period of drastically curtailed business and profits for the automobile industry as a whole. While trade was said to be definitely on the downgrade, and that a further sizable recession might be expected in the second half year, the belief was expressed that the decline is unlikely to be sufficient to prevent total second half-year production and sales from exceeding the volume for the like period of 1928. It was pointed out that second half-year returns doubtless will be well under those for the first six months, but that the outlook indicates that profits of most of the strongly established organizations will be larger in the full year 1929 than in 1928, with the earnings of some concerns setting all-time peaks for a year.

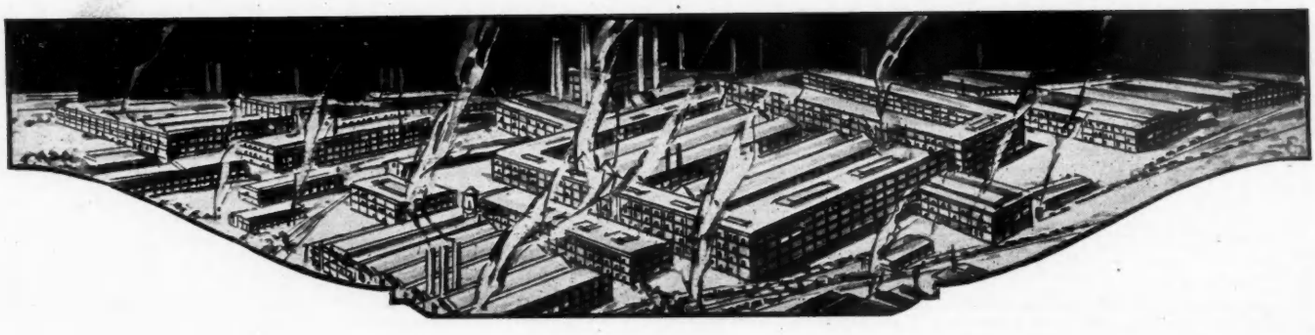
Increased Stocks Not Alarming

Although stocks of new cars are larger than a year ago, the increase has not been regarded with alarm, especially since the recent announcement of new models by several companies with accompanying price reductions in certain instances. The situation also is being relieved somewhat, it is believed, as a result of the reduction of prices on current models by certain companies that have announced the intention of bringing out new models shortly. Recovery of grain prices has been helping the automobile market, particularly in the Middle West. The used car situation naturally has been aggravated somewhat by the large number of new car sales, which usually involve trade-ins, but the effort that is being exerted by manufacturers, distributors and dealers to stimulate the used car business is expected to show results.

The strong export situation was officially indicated by the recent announcement from the Automotive Division of the Department of Commerce that American automotive exports during the first half of 1929 established a new high valuation record of $354,874,924, exceeding those for the same period of 1928 by $92,200,361, or 35.1 per cent.

"To grasp the remarkable strides that have taken place in our sales of automotive products to markets overseas," said the department's statement, "it is only necessary to compare the value of such shipments during the first six months of this year with the January-June total for 1926 amounting to $182,066,573. In the comparatively short period of four years, we have witnessed an improvement of $172,808,351, or 94.9 per cent."

The monthly average for the first half of 1929 was $59,145,485 as against $43,779,094 in 1928; $36,893,851 in 1927, and $30,344,429 in 1926.



Morris Motors, Ltd., Isis Six Has All-Steel *Sedan Body*

Design complies with both export and home market requirements and is said to be the result of a survey made by Sir William Morris during his world tour last year.

By M. W. BOURDON

PARTICULARS have been issued concerning a new six-cylinder model now being put into production by Morris Motors, Ltd., England. Its design is said to be the result of inquiries made by Sir William Morris during his world tour last year and is claimed to comply with requirements of the export markets as well as with those of buyers in Great Britain.

Its chief distinctive feature lies in the construction of the all-steel sedan body and the manner in which this is secured to the chassis; the effect is to make the chassis and body practically a single unit, unaffected to a notable extent by uneven road surfaces.

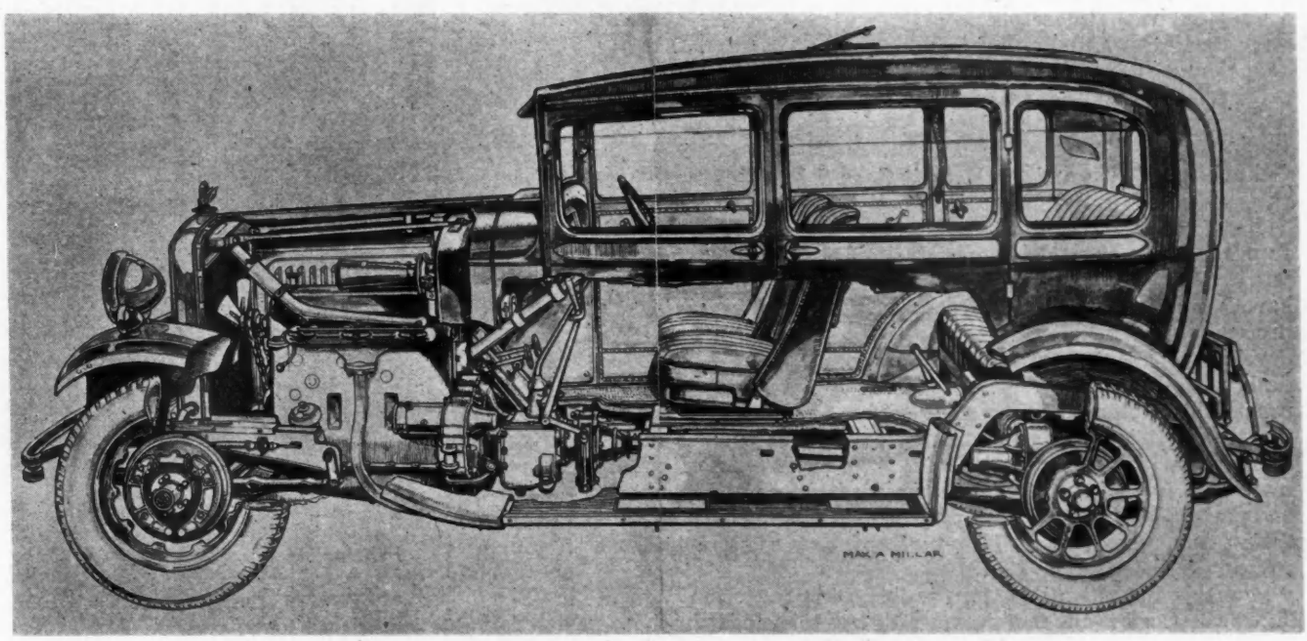
The side rails of the frame are 8 in. deep from the rear end of the engine to the sudden kick-up over the rear axle. The frame is 27 in. across at the front, but widens behind the engine until it becomes 48 in. in width, from behind the gearset to the rear end. There is no side overhang of the body, which fits down over the chassis like the lid of a box and is secured by 25 bolts, all readily accessible. The floor boards are screwed into threaded eyelets in pressings riveted and welded to the frame rails, though hinged traps are provided, where required, to give easy access to chassis and transmission details underneath the floor.

The engine used is practically the same as the existing Morris Six, though embodying certain variations in detail. It has an overhead camshaft, a bore and stroke of 69 x 110 mm. (approximately 2¾ x 4 5/16 in.), and is supported in the frame by four rubber-filled brackets. The overhead camshaft is driven by an inverted tooth chain, with provision for removing the cylinder head and valve gear without upsetting the timing.

The transmission consists of a three-speed unit gearset, with Hotchkiss drive, Spicer joints and spiral bevel rear axle gearing giving a ratio of 5.33 to 1 with 29 x 5.50 in. tires. Hollow steel wheels will be fitted for export and wire wheels for the home market.

An innovation for Morris is the adoption of Lockheed hydraulic braking; 14-in. drums are used and there is a parking brake, hand-operated, behind the gearset. The wheelbase is 114 in., and the track 56 in.

At the moment of writing no price has been announced, but it is said that it will be such as to place the car in direct competition with popular American makes of similar sizes in the export markets.



Cutaway drawing of the new Isis Six car of Morris Motors, Ltd.
(Drawing reproduced from The Autocar)

Manufacture of the New Cord Entailed *Only Minor*

Difficulties similar to those which car had to be overcome, but permitted use of the

By ATHEL F.

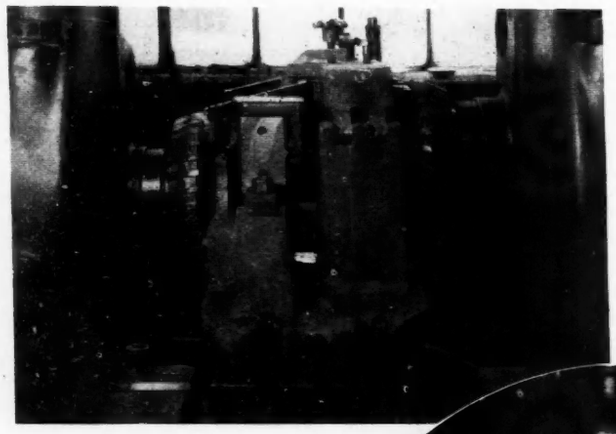


Fig. 1—Above is shown the first rough milling operation on the Cord transmission case

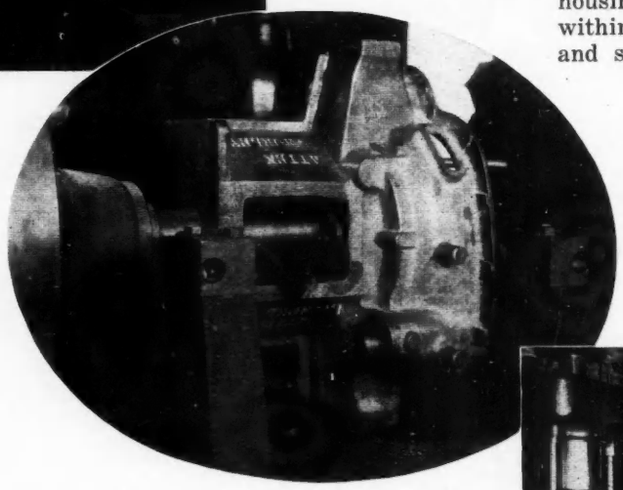


Fig. 2—Transmission case of the Cord car mounted on an arbor for finish machining

THE front drive is a topic of much timely interest to automobile engineers and executives, but there seems to be considerable uncertainty as to the production costs of vehicles embodying this feature. It was, therefore, with particular satisfaction that the writer availed himself of the offer of the Auburn Automobile Co. and its associated suppliers, the Columbia Axle Co. and the Detroit Gear & Machine Co., to investigate the production problems connected with the new Cord front-drive car.

Basically, from these investigations, it appears that the difficulties in producing a front-drive car have more to do with engineering than with production. Of course, numerous minor production difficulties have had to be solved, as with any new car, but no radical changes in processes are apparent, nor have specialized machine tools had to be developed. This, naturally, is largely due to the fairly conventional design of the units comprising the Cord chassis, the engine being practically a standard Lycoming eight, the clutch conventional, and the transmission having normal gearing, but turned on its side as compared with usual practice, etc. The front axle, of course, differs somewhat from conventional rear axle design, with its short housing and multiple universal joints, and the addition of a dead axle carrying the wheels. Rear axles, however, are very similar to conventional front axle I-beams.

Probably the most important problem in connection with the building of the Cord is the maintenance of low tolerances in those parts of the unit powerplant in which any misalignment seriously decreases reliability. These include the companion flanges, both fore and aft of the gearcase, the gearcase mounting flange on the crankcase, and the companion flange on the differential housing. These have to be held to within .003 in. both for parallelism and squareness. In addition, the design of the axle drive pinion mounting in the Cord does not provide for an adjustment either in installation or service, except through the use of spacing washers. These, naturally, have to be sized in direct relation to the distance from

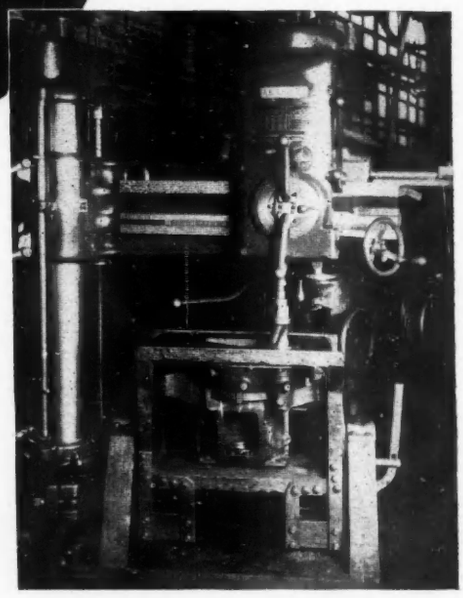


Fig. 3—One of the special operations in milling the unconventional housing of the Cord transmission, is shown above. This view shows a tumbling jig used to eliminate relocating for operations from the reverse side of the case. Note that locating is from the main shaft bearing bores

Front-Wheel Drive *Automobile Production* Changes

accompany the introduction of any new
the conventional design of units
same machine tools.

DENHAM

the cross-bore to the axle housing companion face, the pinion shaft bearing location, and the relation between pinion shaft extension and the transmission case forward face.

In production this means, of course, that low tolerances have to be adhered to for these dimensions, so as to keep down the number of washer sizes it is necessary to carry in stock, especially when it is considered that Auburn engineers require a fit to .0005 in. in pinion and ring gear relation. Since this naturally involves accurate machining of spacer washers, a number of magnetic grinders have been acquired by Auburn to machine these parts.

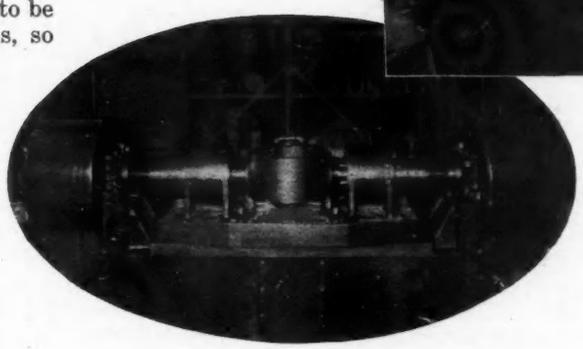


Fig. 4—Machining cross-bores in the Cord differential case

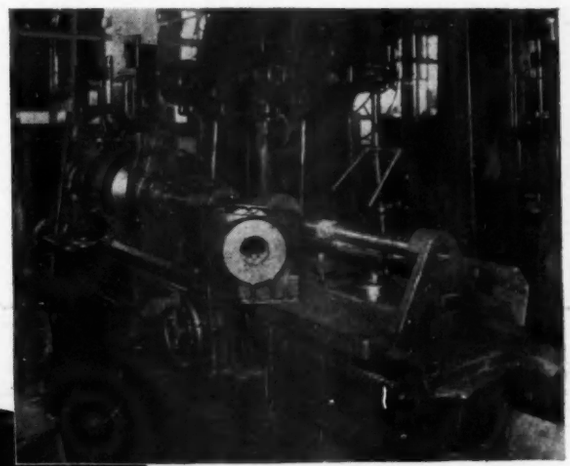


Fig. 5—Finish reaming of the differential case of the Cord is performed as shown above on a lathe converted for line reaming

Although it would seem from this that final assembly of the unit powerplant requires a more accurate control of dimension and alignment, this is offset by the simplification in assembly, since the powerplant, together with the axle, can be assembled and installed in the car as a unit. Moreover, frame and body designs are considerably simplified, due to the absence of a rear axle kick-up, which contributes further to a lowering of the cost of production and assembly.

Going back to the transmission, it is found at the Detroit Gear & Machine Co. that the gears and shafts are machined in the conventional manner. A separate line is installed for the case, however, and several production modifications have had to be made, due partly to the close tolerances required for the forward and rear faces, and partly to the somewhat more complicated design produced by having the clutch housing integral with the transmission case for added rigidity. The case itself is also somewhat heavier than conventional design, for maximum strength and to reduce deflections in operation which would result in momentary misalignment of the driving mechanism.

Fig. 1 shows the first operation on the transmission case, end milling of the companion faces. This is a fairly rough operation, locating being from the transmission mounting brackets. The operation provides, however, the necessary locating faces for the machining of the main shaft bearing carriers. After the machining of the latter, they are in turn used for locating for the remaining operations on such parts as require accurate relative alignment. This includes the finish machining of the companion faces on a Walcott lathe.

In the latter operation, illustrated in Fig. 2, the case itself is mounted on an arbor. The lathe is supplied with a heavy flywheel to minimize the eccentric effect of the mass. With this final operation it has been found possible to keep the face tolerances down to .006 in. indicator runout, or .003 plus or minus, both as to parallelism and squareness with the mainshaft bore.

Due to the more complicated design of the transmission case, quite a few special operations have to be performed, not generally carried out on conventional housings. For instance, mounting bores have to be provided for an additional shaft, carrying the gear engaging the transmission main shaft for cranking of the engine by hand in case of starter failure.

However, a number of these operations, including the drilling of the starter shaft bores, drilling of the countershaft hole, the fan driveshaft hole, and the drilling and semi-finish reaming of the shifter rod holes are performed on a single American radial drill, illustrated in Fig. 3. It shows the tumbling jig used to eliminate

relocating for operations from the reverse side. Note that locating is from the main shaft bearing bores.

The next unit forward, the axle housing or differential case, provides no special production difficulties. Close tolerances, of course, have to be maintained by the Columbia Axle Co. in the relation of the cross-shaft bore with the companion flange, and the ring gear offset, as previously indicated.

The case itself is cast iron, and in that respect, of course, is a departure from conventional practice, and since maximum rigidity is required, it is made in the form of a single casting with a front cover only. As the differential has to be assembled into the case, end milling has had to be resorted to for the machining of the faces of the differential adjustment carrier halves, which are cast integral with the case.

The differential case is received by the Columbia Axle Co. with all four faces finish-machined. These operations are performed by the supplier on Ingersoll crankcase millers, and held to .003 in. The first subsequent operation then is the machining of the cross-bores. This is performed on the double-ended Baker shown in Fig. 4, and comprises drilling, rough reaming and semi-finish reaming of the bore. Locating, it will be noted, is from the transmission case companion face and dowel holes. The finish reaming operation to .002 in. is performed at a later stage on a lathe converted for line reaming, and illustrated in Fig. 5. Locating here is also from the companion face and from the pinion-shaft-bearing mounting bore, the latter fitting over the round projection of the fixture shown below the reamer. This locating disk is eccentrically mounted on the fixture and graduated to make possible accurate adjustment for ring gear offset, which is held to plus .002, minus nothing. Naturally, a very accurate tolerance control is achieved by the line reaming process, but with the Columbia Axle Co. this operation is one of routine, similar line reaming operations being carried out on conventional axles.

Unconventional design, rather than unorthodox production practice, is also characteristic of the tubular dead axle carrying the steering knuckles. The tube itself as well as the knuckles, is of chrome-molybdenum steel and is bent cold to a 40-deg. angle after heat-treating.

Hot working of the tube and subsequent heat-treatment has been found inapplicable, due to the ¼-in. tube sectional thickness, but cold working appears to have presented no major difficulties, since experimental normalizing of cold worked tubes has not indicated any appreciable internal stresses resulting from the process, which would be apparent if the tube tended to straighten itself out under such a test.

These tubes are received by the Columbia Axle Co. already bent, and with a 1/16 in. per ft. taper for the knuckle mounting swaged at the outer ends. Knuckles present no unusual machining difficulties, and in fact are jobbed out. However, the assembly of the knuckles on the axle ends presented a little problem at first, since the yokes have to be held in alignment with each other to 1/32 in.

The use of a keyway guide was attempted at first, but found rather unsatisfactory. Thereupon the present set-up was developed, illustrated in Fig. 6. It consists of a Metalwood 20-ton hydraulic horizontal press, shown at the left, equipped with a fixture for rigidity locking the bent tubular axle in place. The first knuckle is then pressed on, using the king pin bosses as a guide, as shown in the illustration. The axle is then removed from the press and placed on the aligning table shown at the right. Here the second knuckle is started on the taper by hand, while maintaining a constant alignment check by means of the king pins. When the second knuckle is set on the axle and is in proper alignment with the first knuckle, the assembly is again placed on the Metalwood, and the knuckle pressed home. The assembly is completed by arc welding the knuckle to the tube at the outer end by hand. Knuckles themselves are forged, of course, and of 277 Brinell hardness.

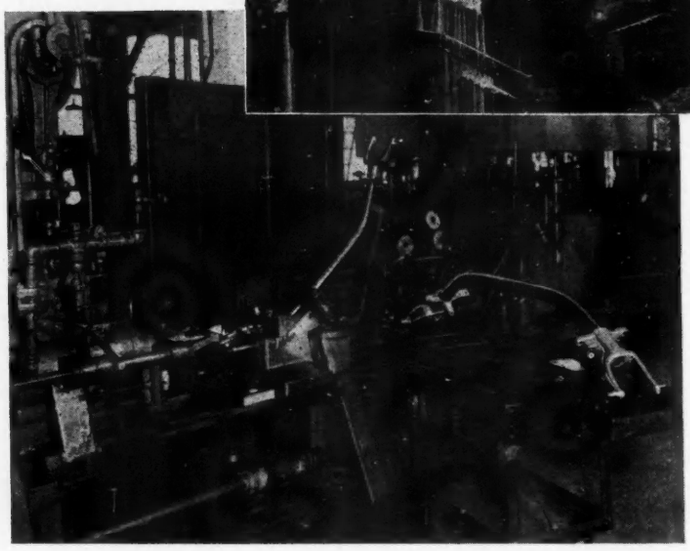


Fig. 7—Process for machining the rear axle of the Cord

Fig. 6—Press used for assembly of knuckles on the tubular dead front axle of the Cord car

The remainder of the dead axle assembly consists of spindle yoke, split at the king pins for assembly, and bronze and steel bushings fitting on the king pins, the former locked in the spindle yoke, and the latter pressed on to the pins for service replacement if necessary. The lower king pin bearing cap has the steering and drag link brackets forged integrally with it. This general design of course results from the requirement of having the front driveshaft outer universals and the king pins in line with each other. (See A. I., June 29, 1929, pp. 974-980.)

The simplicity of the production process for machin-

(*Continued on page 264*)

Studebaker Offers Delivery Wagons In Thirteen Body Combinations

Design includes truck ruggedness with passenger car styles. Prices range from $845 for the ¾-ton chassis upward to $1,720 for the 4000-lb. panel or screen model.

THE Studebaker Corp. announces a new line of delivery wagons comprising three distinct chassis and 13 body combinations. All three chassis are equipped with the same six-cylinder engine, with a bore of 3⅜ and a stroke of 4⅛ in., giving a piston displacement of 221 cu. in. The engine develops 68 hp. Of the three chassis models, one has a rating of ¾ ton and a wheelbase of 115 in.; the second has a rating of 1 ton and a wheelbase of 130 in., while the third is given a gross-weight rating of 4000 lb. and has a wheelbase of 146 in.

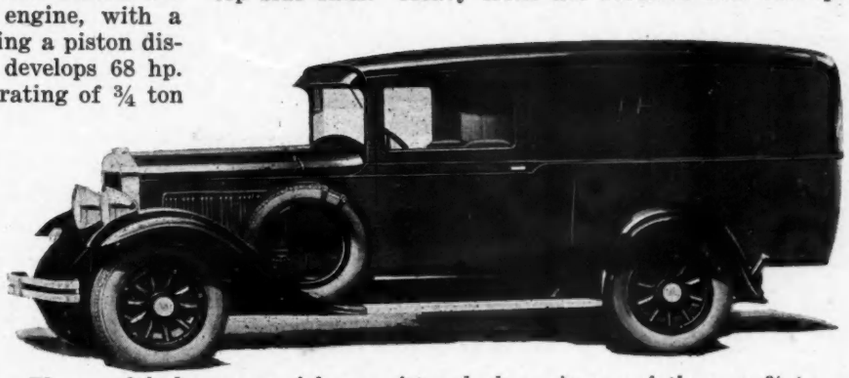
In the design of the new delivery cars the aim of Studebaker engineers has been to combine truck ruggedness with passenger car style. A sweeping roof line and a full-curved rear top and corners are features of the body design. A new treatment of belt line and door paneling gives an unbroken line from the cowl. A cadet type visor is used on all bodies of 48 in. height and on bodies on the 4000-lb. truck series having a height of 52 in. and a length of 108 and 96 in. An integral roof visor is used on all other bodies.

Buyers are given a choice of four colors. Lacquer finish is used exclusively, hand-rubbed and polished. Where formerly the side doors were built to the roof, they are now cut square, giving the front of the units a beautiful and distinctive appearance.

Floor heights are unusually low. The ¾-ton unit, when unloaded, is 26½ in. from the ground; the 1 ton and 4000 lb. truck chassis, 27 in.

A number of unusual features are incorporated in the bodies. The sub-frame, built of hardwood and strongly reinforced with corner forgings and steel rails, is cut away at the frame kick-up. This allows the floor to rest directly on the chassis frame, making possible a saving in floor height of from 2 to 6 in. The floor is sealed against dust and moisture by special I-iron joints which permit free expansion and contraction and also act as skids for sliding heavy packages.

The super-structure of the body is made of hardwood, the uprights being mortised and bolted to the floor and top side rails. Heavy irons are recessed into the uprights. Belt-boards, 6 in. wide, and inside top corner rails add to the strength of the bodies. The closely spaced roof bows are band-sawed to shape from 4-in. strips and carry longitudinal roof slats. The side doors are 35 in. wide. They, as well as the rear doors, are of all-steel construction and are hung on heavy hinges.



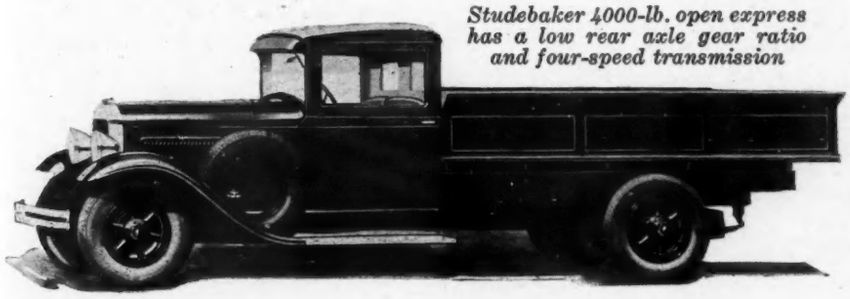
The panel body commercial car, pictured above, is one of the new ¾-ton units offered by Studebaker

Other features of the bodies include dome lights in the panel delivery cars; a flood light to illuminate the driving compartment; adjustable seats tilted to a comfortable driving angle and upholstered in leather; an adjustable steering column and a rubber mat in the driver's compartment; a rear-vision mirror and a full-width tool box under the seats. The spare tire is carried in a well in the left front fender.

Chromium plating is used on all exterior bright work. Additional refinements include twin-beam headlights controlled from the steering wheel; an automatic windshield cleaner; a 17-in. steel-core safety steering wheel; one key which fits the coincidental steering-ignition lock, side and rear door locks and spare tire lock. The attractive instrument board carries a speedometer, hydrostatic gas gage, oil pressure gage, ammeter and engine thermometer neatly grouped under glass and indirectly illuminated.

The front and rear axles are fitted with Timken roller bearings, which are also used on the differential and on the steering knuckles. The drop-forged front axles have reversed Elliott axle ends, while the rear axle shafts are of chrome-molybdenum steel.

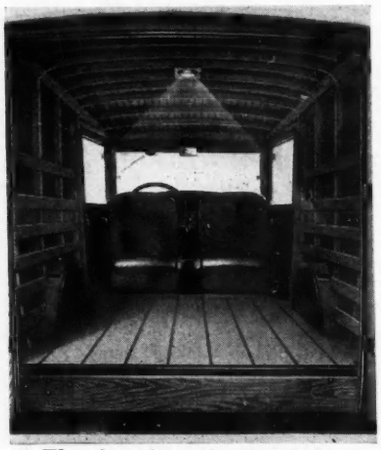
Studebaker 4000-lb. open express has a low rear axle gear ratio and four-speed transmission



Mechanical four-wheel brakes with amplified action are fitted. Wood wheels are standard equipment on the ¾-ton and 1-ton chassis, wire wheels being optional at extra charge. Clark metal-spoke wheels are furnished as standard equipment on the 4000-lb. truck chassis. On the ¾-ton unit, tires are 19 x 6.00 ballon, heavy-duty 6-ply. On the 1-ton the tires are 30 x 5 high-pressure heavy-duty 8-ply on the rear and 20 x 6.00 6-ply ballon in front; on the 4000-lb. truck chassis 30 x 5 high-pressure heavy-duty tires are used in front and 32 x 6 high-pressure 10-ply heavy-duty in the rear.

With the ¾-ton delivery cars on a 115-in. wheelbase a choice is offered of two panel body styles—72-in. loading length with 48 or 52-in. headroom. A de luxe model of the ¾-ton panel carries five wire wheels. A screen body is offered with 72-in. loading length and a 52-in. height. This unit has removable and weatherproof curtains.

A choice of four body styles is given on the 1-ton unit. The panel body is offered in two body lengths—84 and 96 in. Two heights are also available, either 48 or 52 in. A de luxe model carries five wire wheels. A screen type car of the largest capacity is also available on the 1-ton chassis. This chassis also is available with a de luxe coupe style cab for special bodies.



The interior of Studebaker panel body, as shown above, is fitted with a dome light

The 4000-lb. truck chassis has four speeds forward and a low rear axle gear ratio. It is offered in four panel body styles—two with 108-in. loading space and either 56 or 52-in. height, and two with 96-in. loading space and 56 or 52-in. height. There are also two screen types with loading lengths of 108 or 96 in., having a height of 56 in.

In addition, there are available on this chassis an open express and a stake type of body. It has a low floor, and because the rear axle is located 42 in. from the rear end of the floor, two-thirds of the load is carried ahead of the rear axle. This unit, with its four-speed transmission, is said to have a speed range of 6 to 55 m.p.h., which makes it suitable for fast services of all kinds.

Prices of the various models are given in the following tabulation:

Model	¾ ton	1 ton	4000 lb.
Chassis	$845	$1,045	$1,245
Panel	1,175	1,495	1,720
Screen	1,175	1,495	1,720
Chassis and cab	....	1,275	1,495

New Emsco Challenger Tested

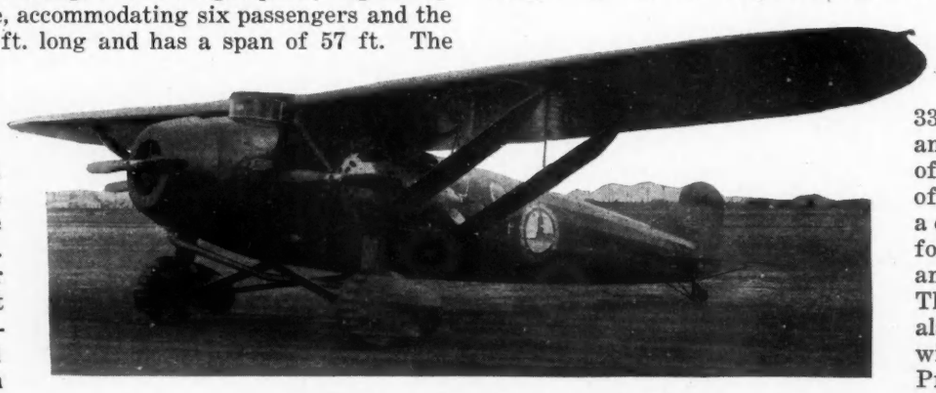
THE first of the three models of planes to be built by the Emsco Aircraft Corp., Downey, Cal., was completed some time ago and has had its flying tests. It is known as the Emsco Challenger and is powered with three Wright Challenger engines of 170 hp. each. The other two models, on which work is now in progress, will be the single-motored Emsco Wright and the two-place sport and training plane, the Emsco Cirrus. It is expected to have these two finished in time to permit of flying all three to the National Aircraft Races and Exposition which will be held in Cleveland, Aug. 24 to Sept. 2. We are informed that the Emsco Challenger, the first machine to be completed, has completed a tour of the northwestern United States and Canada and has been purchased by the Emsco Derrick & Equipment Co., an affiliated enterprise, also controlled by E. M. Smith, founder of the Emsco Aircraft Corp.

The Emsco Challenger is an eight-place, high-wing cabin monoplane, accommodating six passengers and the pilot. It is 36 ft. long and has a span of 57 ft. The fuselage is of welded chrome-molybdenum steel tubing and resembles the monocoque type of construction. It is claimed for the plane that it is capable of carrying a pay load unusually high in proportion to its horsepower, that it will land at as low a speed as 50 m.p.h. under full load, and that it operates economically in transport work.

We are informed that in the performance tests the plane reached a maximum speed of 130 m.p.h., a cruising speed of 100 m.p.h. and a ceiling of 15,000 ft. It is said to be capable of taking off under full load with any two of the three engines.

The weight of the Emsco Challenger with full load is 5700 lb., of which 1190 lb. is pay load and 2338 lb. useful load. The wings have box-type spars of spruce and are covered with fabric. Equipment furnished with this machine includes Bendix brakes, Aero shock-absorbing struts, Eclipse starters, running and landing lights and all instruments required by the Department of Commerce.

Of the two planes now under construction, the Emsco Wright has the same specifications as the Challenger except that it is powered with a single Wright J-6 330-hp. engine and a wingspread of 60 ft. instead of 57. It also has accommodations for six passengers and two pilots. This type may also be powered with a 425 hp. Pratt & Whitney Wasp.



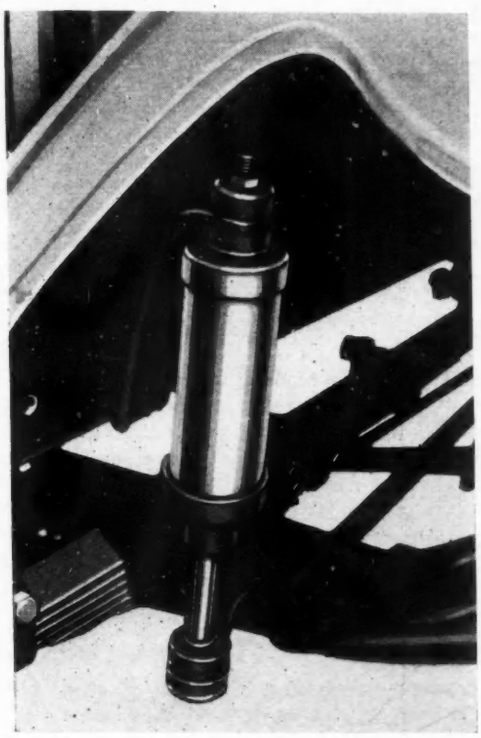
The trimotored Emsco Challenger

Gemmer Pneumatic Shock Absorber Resembles Double-Acting Pump

New "Controller," recently made available for high production cars, uses automatic air pressure as cushioning element and vacuum feature to govern rebound.

INTRODUCTION of the "Gemmer Controller," a new type of shock absorber, using air as a cushioning element and vacuum to control rebound, is announced by the Gemmer Mfg. Co. of Detroit. Aside from its bringing the pneumatic type of shock absorber into a price field where it can be adopted on high-production automobiles, it has the features of simplicity of design and operation, permanence of adjustment, automatic control of air pressure, absence of all parts requiring lubrication, low weight, and ease of assembly.

Essentially, the instrument resembles a double-acting plunger type pump, being composed of a cylinder, flexibly attached to the frame through a stamped bracket, and a piston and rod, the latter flexibly attached to the axle. In the normal position, the center of the piston is approximately 2 in. above the bottom of the cylinder. As the controller is compressed on striking a bump, the piston travels upward, compressing the air ahead of it. Referring to the Model A illustration, showing a ball valve in the piston rod, it will be noted that one side of the seat is slotted slightly to permit of metered escape of the compressed air to the lower part of the chamber.

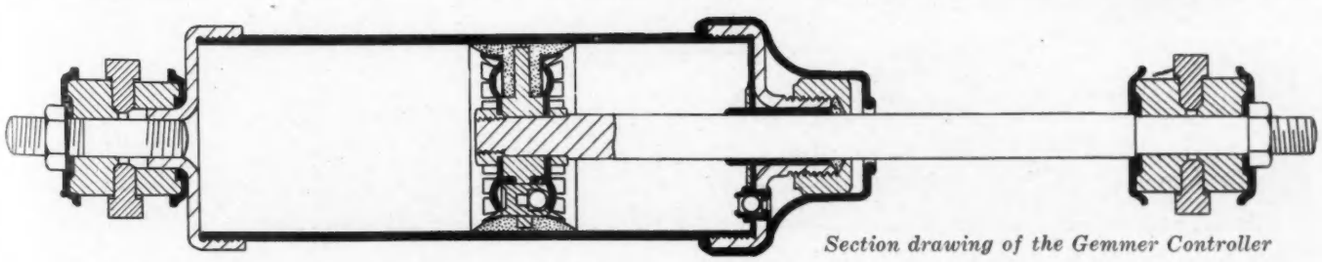


The new Gemmer Controller is shown above mounted on the frame and axle of a car

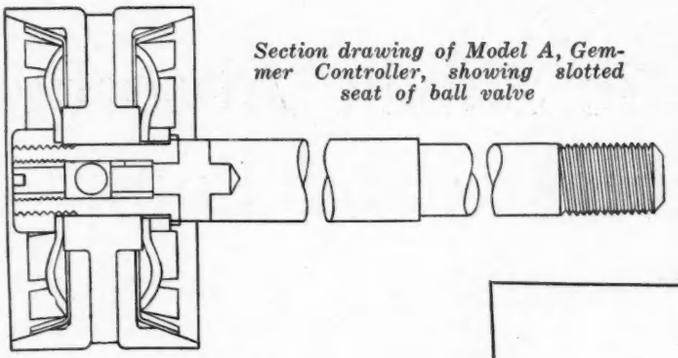
At the top of a relatively slow stroke, therefore, pressures in upper and lower cylinders will tend to balance themselves. As the piston starts down on the rebound stroke the ball seats itself by a combination of inertia and air pressure on the upper seat of the check valve, creating a vacuum above the piston as it travels down, and also compressing the air ahead of it in the lower part of the chamber. Naturally, the amount of rebound control can be regulated by varying initially the distance of travel of the ball between its two seats, thus affecting the rapidity with which the vacuum and pressure are built up on the rebound stroke.

On a severer shock, where rapid motion of the piston upward take place, and to prevent too rapid take-up on the compression stroke, by means of the vacuum, which would normally be created below the piston in such a case, another ball valve, shown in the illustration of the assembly of the Model B, opens in the base of the cylinder, admitting additional air. As the stroke is slowed up, due to the compression of air above the piston, and the pressure in the lower part increases by passage downward of the air from above, some of this air will be again expelled before the ball again seats itself. Its function, therefore, is a regulatory one, assuring a constant and automatic supply of air, as and when needed. It also assures continuity of control at any point of piston travel with repeated shocks.

The piston is composed of two cupped leather washers, impregnated with lubricant and specially treated, and two spring-steel spreaders for the cup washers, mounted on a die casting. The various parts are all assembled at one time on the piston rod by means of the single nut

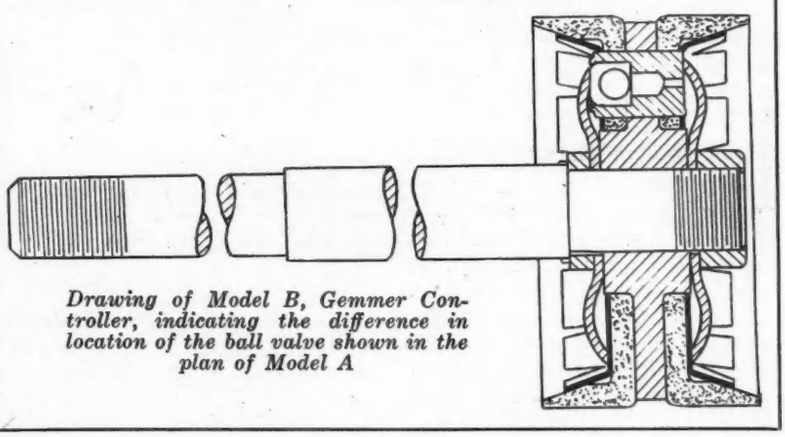


Section drawing of the Gemmer Controller



Section drawing of Model A, Gemmer Controller, showing slotted seat of ball valve

Models A and B is that in the former a slower take-up is provided than with the valve in the piston in the Model B. The rapidity of take-up and proportions of compression to rebound control can be varied by changing the slot size in the lower ball seat, enabling the use of ratios ranging from 50-50 to 90-10 or more. Absence of springs in the ball valve assemblies also makes for more accurate maintenance of control, without adjustment in service.



Drawing of Model B, Gemmer Controller, indicating the difference in location of the ball valve shown in the plan of Model A

at the upper end, spring washers being placed at either end of the assembly, as shown in the drawings. The leather cups, it is stated, seem to show practically no signs of wear even after two years of service use.

For rust-prevention the piston rod is cadmium-plated. It rides in an oilless type of bushing at the lower end. As an additional precaution against dust or moisture entering the cylinder through the lower ball check valve, a cap fits over the lower cylinder end, with sufficient clearance to permit air to reach the ball check valve.

An interior diameter of 2 in. has been adopted for the cylinder, with a 1 1/16-in. overall piston length. Cylinder length, of course, can be varied for different types of installations, but will generally range from 6-in. to 9-in. interior length, in every case the normal position of the piston center being about 2 in. above the bottom.

The difference in the location of the ball valve in

Attachment of the device in the chassis is by flexible mountings. These are composed of two thick rubber washers, placed one above and one below the frame or axle bracket, and compressed initially by the single nut at either end. Holes in the frame and axle bracket are somewhat larger than the stud ends of the controller, so that a sufficient universal joint action for the relatively low deflections is provided by the rubber washers.

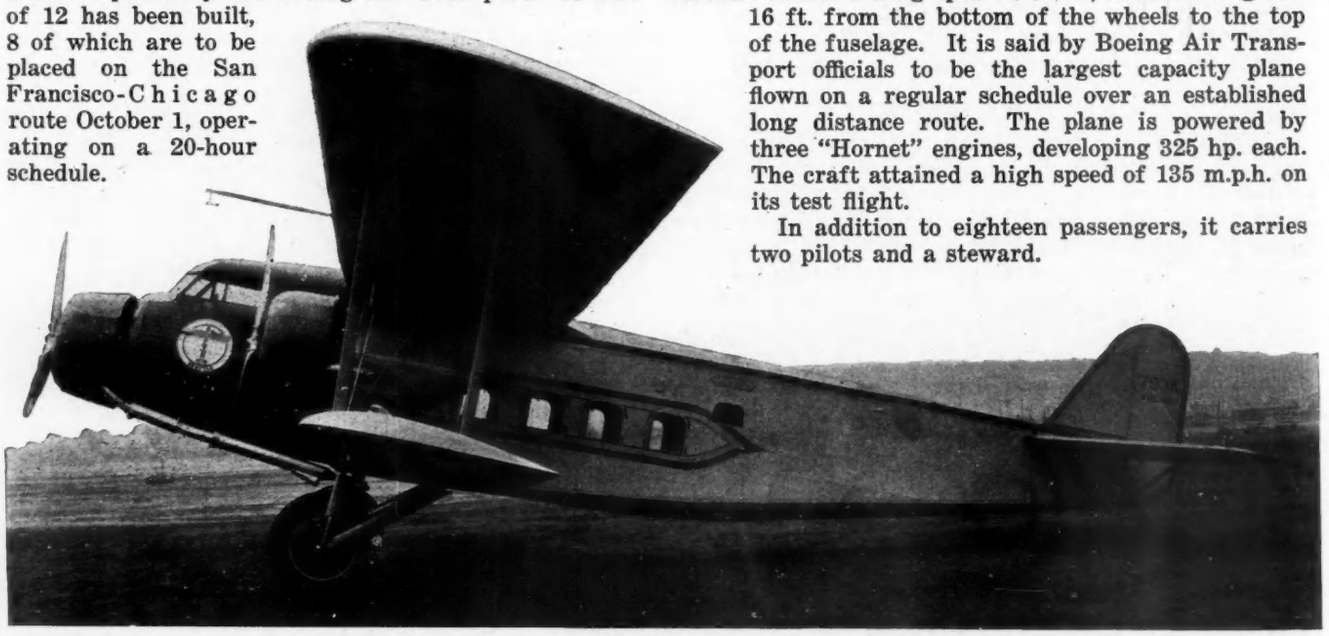
Weight of the device ranges as low as 3½ lb. per unit.

Boeing Develops Transport for Cross-Country Route

A NEW 18-passenger tri-motored transport has been completed by the Boeing Air Transport. A fleet of 12 has been built, 8 of which are to be placed on the San Francisco-Chicago route October 1, operating on a 20-hour schedule.

This Boeing biplane weighs 8½ tons when fully loaded. It has a wing span of 80 ft., is 55 ft. long and 16 ft. from the bottom of the wheels to the top of the fuselage. It is said by Boeing Air Transport officials to be the largest capacity plane flown on a regular schedule over an established long distance route. The plane is powered by three "Hornet" engines, developing 325 hp. each. The craft attained a high speed of 135 m.p.h. on its test flight.

In addition to eighteen passengers, it carries two pilots and a steward.



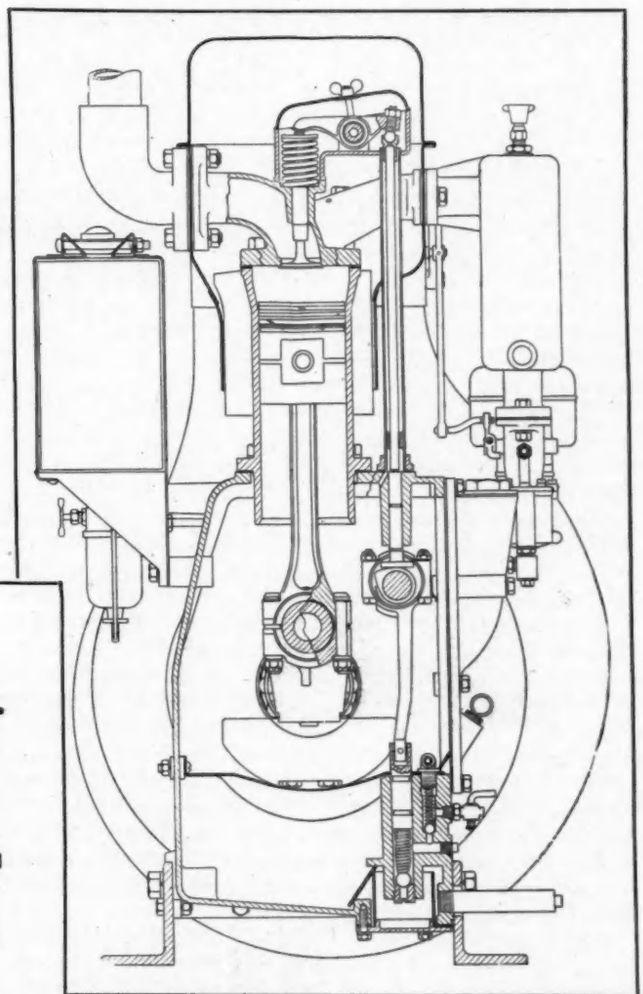
Above is pictured the Boeing trimotored transport recently completed, which will be one of the 12 planes put in service between Chicago and San Francisco on Oct. 1. The biplane will be a feature at the Cleveland Aircraft Show

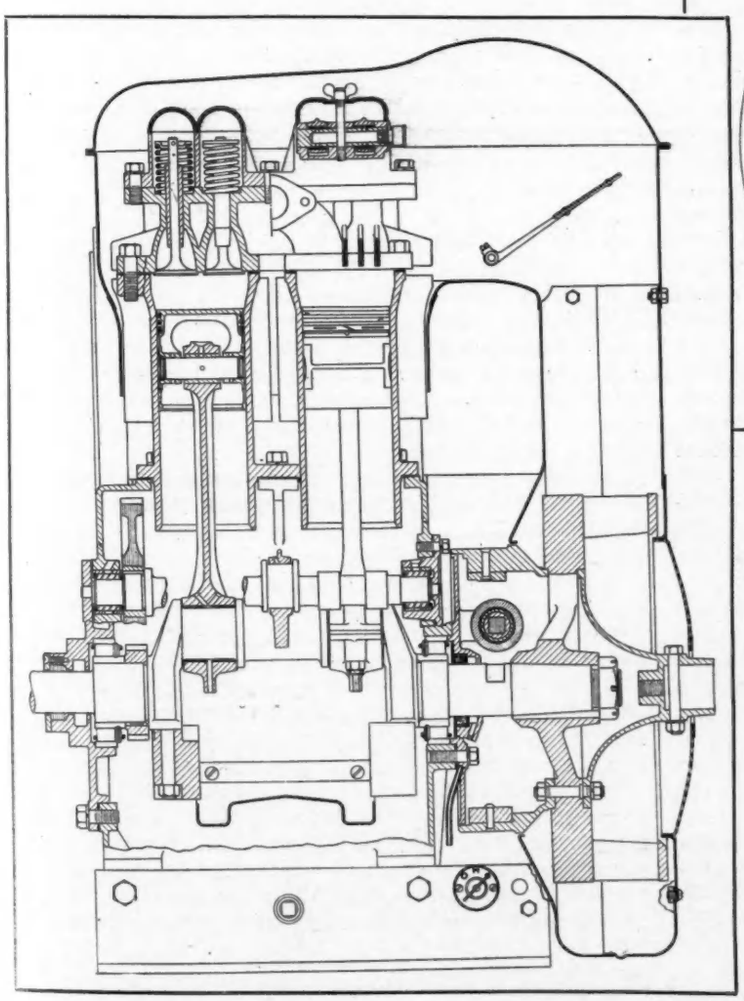
New-Way Two-Cylinder Engine Is Air-Cooled Farm Type

Powerplant, developing 6-10 hp., can be operated on gasoline, kerosene, alcohol and natural or artificial gas.

SECTIONAL drawings are shown herewith of the New-Way two-cylinder 6-10 hp. air-cooled industrial and farm engine. It is a two-cylinder engine with a bore of 3 and a stroke of 4 in., giving it a displacement of 56.5 cu. in. It operates at 60 lb. gage compression.

Cooling is effected by means of a flywheel fan which forces a current of air through jackets over the finned cylinders. The cylinders are cast of alloy iron, with a detachable cylinder head in which the valves are located. The valves are made of Silcrome steel and are operated through enclosed side rods. The cylinder bores are finished by honing. The pistons are of cast iron and of light design, while the connecting rods are made of Lynite aluminum alloy. Metric spark plugs are used.





The drawing to the left is a longitudinal section of New-Way industrial and farm engine. The cross section plan of the engine is shown above

Both the crankshaft and the camshaft are mounted on anti-friction bearings, the crankshaft on Bower and the camshaft on Hyatt roller bearings. Babbitt is spun into the Lynite connecting rod for the big-end bearing, which can be adjusted by means of shims. The piston pin, which is ¾ in. in diameter, is full-floating. Crankpin bearings are 1¾ in. in diameter and 1⅞ in. long. The connecting rod has a center-to-center length of 9 in.

A gas-inertia type of governor, of a special design, on which a patent has been applied for, is fitted. The speed can be controlled by hand between 400 and 1800 r.p.m. The camshaft

drive is through two gears, that on the camshaft being made of non-metallic material.

A Tillotson float-feed, automobile-type carburetor is fitted, and is provided with an air-cleaner. The crankcase is ventilated, and no trouble is said to be experienced from crankcase dilution. Ignition is by an Eisemann magneto. Lubrication is by the circulating splash system, a plunger pump operated by eccentric from the camshaft being located in the bottom of the crankcase. The oil capacity of the engine is one gal. The engine can be operated on gasoline, kerosene, alcohol, natural or artificial gas. It is normally provided with a 2½-gal. fuel tank. The New-Way engine is manufactured by the New-Way Motor Co., Lansing, Mich.

Only Minor Production Changes Entailed by the Manufacture of the Cord Front-Wheel Drive Car

(Continued from page 258)

ing the rear dead axle is well illustrated in Fig. 7, which shows the set-up for drilling, and rough and finish reaming of the tapered wheel spindle hole at the rear, and that for drilling both brake anchor plate stud holes at both ends on two axles simultaneously at the front. The machine tool is a double ended Colburn with an indexing table and quick chucking drill heads. In operation, a run is made with the first set-up (machining spindles), the table is then indexed, and the same operator completes the machining operations on the same lathe. Automatic stops are provided for the first set-up on the holding fixture, to properly size the tapered spindle hole. Machining of the internal face of the brake anchor plate stud holes is accomplished with a bayonet tool, and with reverse feed on another lathe, milling not being possible due to interference of the axle end webs.

These illustrations, picked as the most unorthodox in the plants visited, would seem to indicate that, basically, front-drive car production is not as serious a problem as is believed in some circles. We have seen a number of "standard" axles, as for instance that of the Rickenbacker some years ago, and that of the present Duesenberg, which required considerably more new tool design and production realignment than the Cord front-drive axles. Which, after all, speaks well for the cooperation between Auburn engineers and production men in solving their joint problems by design rather than by new manufacturing processes or special tools.

Another good instance of this is found in the front spring mounting of the Cord. It was found on the experimental cars that the Cord, like practically all cars, is quite sensitive to castor. It is also well known that on any car castor will change considerably of its own accord over a period of several thousand miles. A number of manufacturers recommend shimming of the spring seats to correct for this in service. Since a similar provision would have complicated the front axle spring mounting design and production, another method, which has distinct advantages in its simplicity, was worked out. The Cord, it will be remembered, has a set of two ¼ elliptic springs at the front on each side, one spring being attached above and the other below the frame side member and dead axle. This provides a parallelogram motion with a constant castor for the front axle during spring deflection. To take care of castor changes over a period of time, the lower spring rear end has its U-bolts passing through a forged housing around the spring end, elongated holes being provided for the U-bolts in the frame side member. A bracket is riveted to the under side of the lower side channel flange, and through this passes a fine thread screw, which screws into a tapped hole in the aforementioned spring housing. By loosening the spring bolts, the castor of the axle can, therefore, be quickly adjusted in production and service by merely turning this screw on either or both lower springs.

These are only engineering details, however. With increased production and gradual simplification of design, as more knowledge is acquired as the result of widespread owner operation, it does seem reasonable to assume that production costs can be reduced to a basis comparing not unfavorably with that of the rear-drive car. In the meantime, the retention of fairly conventionalized chassis units makes unnecessary, as has been demonstrated in the Cord, development of radically new production processes, or the scrapping of considerable amounts of tools. And whatever additional cost there is in the producing of the powerplant and drive mechanism assembly should be offset even under these conditions to a considerable extent by the lower costs made possible by simplified and lighter body designs, simpler frame construction, and simplified assembly operations.

Italian Motor Fuel Exposition

A MOVEMENT has been initiated jointly by the Italian National Forestry Committee (of which Signor Arnaldo Mussolini is president), the National Fuels Control Association, and the Touring Club of Italy, to hold an international exposition and competition at Milan next year with a view to developing an Italian national motor fuel.

There will be admitted to the exposition portable ovens for the carbonization of wood, of twigs and of wood shavings, etc.; the various solid fuels for gas producers, such as wood, wood charcoal, artificial or prepared fuels, lignites, semi-coke of lignite, peat and wood waste; also generators for internal combustion engines mounted on automobiles, agricultural tractors, motor boats, electric generating sets and motor pumps; also liquid fuels of native production (naphtha and alcohol), motors and devices for the use of substitute fuels of native production and low price, and machines and instruments for comminution of plantes and woods.

The object of this exposition and competition, aside from giving visitors the opportunity of seeing all of the machines and devices in operation, is primarily to encourage the development of machinery and native fuels in Italy, by awarding diplomas and cash prizes. The organizing committee has appropriated prizes to the amount of 200,000 lire. It has its headquarters at the office of the Touring Club of Italy in Milan.

Just Among Ourselves

Inventive Genius Has New Field

REGARDLESS of the feelings and opportunities of the individual inventor, to which we gave some attention last week, industry itself and, perhaps, American social progress in the future may be entirely dependent upon the success of his efforts. The invention of new commodities to meet new public desires, the creation of new industries to supply the commodities and the opening of new jobs in these industries, for example, constitute the chief means by which we will be able to meet the rather acute problems of technological unemployment brought about by the replacement of men by machines in our older industries, according to George Harrison Phelps in his new and very interesting book "Our Biggest Customer." "Inventive genius," Mr. Phelps says, "has in large measure devoted itself to speeding up the older industries. It must now turn to searching out new public tastes and wants."

* * *

Unemployment Basically a Marketing Problem

THE main thesis of Mr. Phelps' volume is that the working man is the best customer of industry and that industry's concern with unemployment, industrial relations and wage conditions is only to a limited extent a purely manufacturing or even a social question, but that in its basic aspects it really becomes industry's most important marketing problem. "Every man put out of a job is put out of the market." Through this channel Mr. Phelps, widely known throughout the automotive field as head of the advertising agency of George Harrison Phelps, Inc., gets into the problems of unemployment, labor relationships and wage payments. He makes clear in forceful language the fact that, while new industries have to a large extent created as many jobs as old industries have closed up through substitution of machines for men, the individual who loses his job in the old industry does not immediately go into a job in the new industry. Despite the general statistical balance which can readily be proved, there is a vast amount of individual unemployment and suffering. "The door to the new job doesn't open as the door to the old one slams on the fired worker's back," Mr. Phelps points out.

* * *

Firing at Fifty a Stimulating Chapter

"OUR Biggest Customer," incidentally, contains the clearest and soundest presentation of the argument against firing older men and replacing them with youngsters that we have run into for some time. Most of this particular discussion is contained in a chapter called "Firing at Fifty." The whole book runs only to 192 pages, can easily be read in less than two hours and can be guaranteed to stimulate the thought of any automotive executive who will read it. It's well worth attention even though one may disagree with some of the ideas expressed.

* * *

When is a Standard Not a Standard?

STANDARDIZATION work of the S.A.E. has been and is one of the bulwarks upon which the American automotive industry is founded. It has seemed to us, however, that closer current check might well be kept on the percentage of use of individual standards. It seems logical to assume that one of two things must be true of an approved standard if investigation proves that it is not fairly widely used: either the standard is out of date and should be revised, or the sound economic reasons for its wider use should be more actively promoted to the executives of the vehicle factories. Just for instance we checked with 25-passenger car makers as regards use of the S.A.E. standard connecting rod bolt. Not a single one of them use it.

Doubtless we happened on to a particularly bad case. Detailed checking of the records on the more important standards, however, would seem to us to be a good way of infusing new vigor into the job of keeping standards up to date and getting them into maximum use.

* * *

Airplane Operation Costs Enter the "Limousine" Field

THE Ryan Aircraft Corp. has just sent out a piece of interesting publicity regarding a compilation on airplane operating costs. This company says it has "carefully checked total operation figures kept by a number of users over a long period of time."

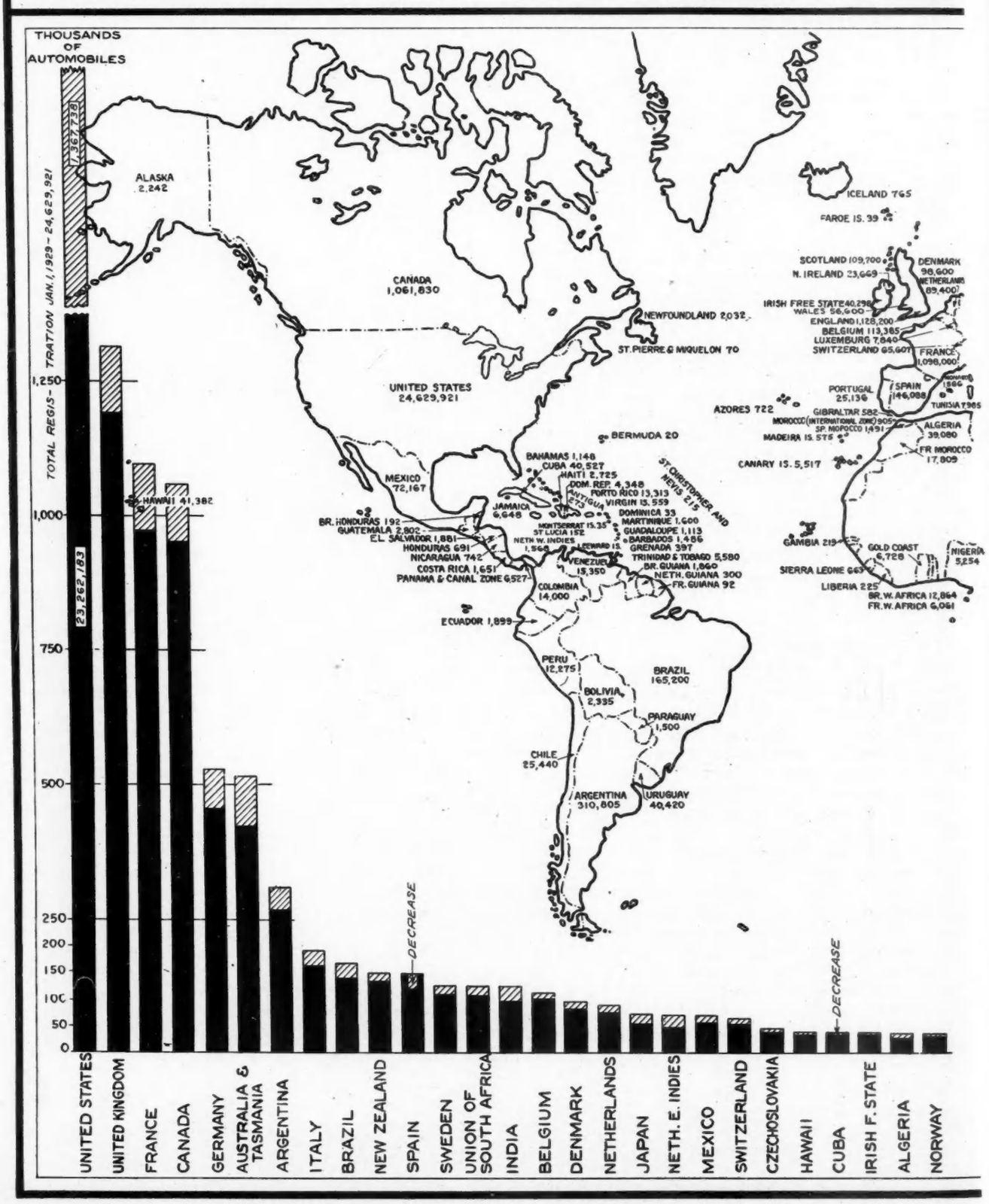
"It has been found," the statement continues, "that the cost of operating this type of plane when used 500 hours a year amounts to $0.23 a mile. This figure includes all expense such as depreciation, figured at 25 per cent a year on the plane, and 33 1/3 per cent a year on the engine, pilot's salary at $3,000 per year and bonus for flying time, crash, liability, fire, and tornado insurance, hangar rent, overhauls, gasoline and oil.

"When a full load of five passengers and pilot is carried, the cost per mile per passenger amounts to less than five cents a mile, or considerably less than the operation cost of a medium-priced car. When the plane is used more than 500 hours a year, cost per mile is less.

"The cost of operating this type of plane should be compared with an expensive limousine in which comparative accommodations are found."—N.G.S.

WORLD *AUTOMOBILES TOTAL NO.

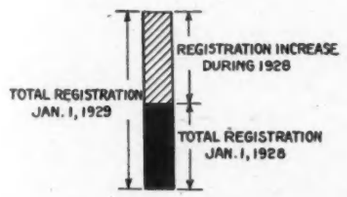
COMPILED IN AUTOMOTIVE DIVISION



CENSUS OF (ESTIMATED) JAN. 1ST 1929

32,028,584

TOTAL NO. JAN. 1, 1928 – 29,687,499



✱ INCLUDES PASSENGER CARS, TRUCKS, AND BUSSES. (2,262,932 MOTORCYCLES IN USE JAN. 1, 1929 NOT INCLUDED HERE). FIGURES BASED ON GOVERNMENT STATISTICS OR OTHER BEST AVAILABLE DATA.

U.S. BUREAU OF FOREIGN & DOMESTIC COMMERCE (D.D. 4232)

J. I. Case Co. Announces New With Engine Arranged

Change from transverse position after field tests of four advantages in merchan

By P. M.

A NEW tractor, known as Model L, has been placed on the market by the J. I. Case T. M. Co., Inc., of Racine, Wis. It is rated as a four-plow tractor and differs from previous Case models in having the engine arranged longitudinally instead of transversely. In the information furnished regarding the new model the reason for this change in design is not explained. It may be that, since the majority of all tractors (and all trucks and passenger cars) have the engine arranged longitudinally, farmers consider this arrangement the more natural or logical one, so that a tractor of different type meets with more sales resistance.

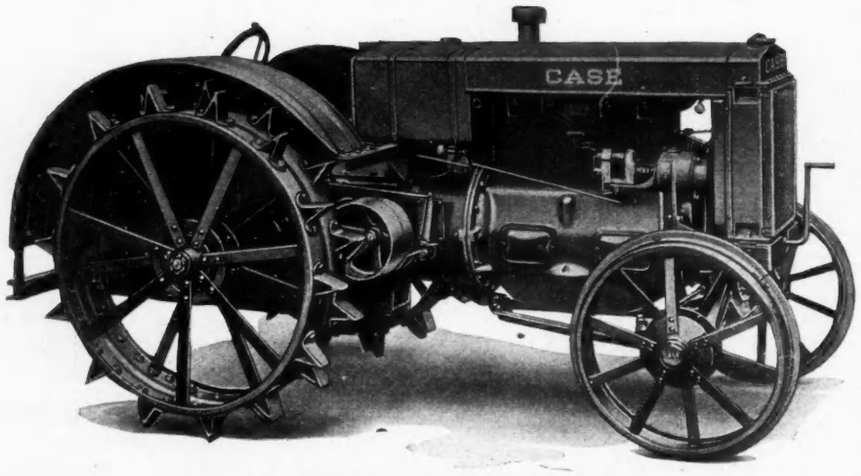
The transverse arrangement of the engine has a number of advantages. It permits of mounting the belt pulley on an extension of the crankshaft, so that belt power need not be transmitted through gears. Moreover, the transmission to the driving axle can be effected entirely by spur gears, so no thrust loads incidental to the use of bevel gears need to be provided for. On the other hand, with a transverse engine and all-spur-gear drive the wheelbase naturally comes out small and the center of gravity of the tractor will be closer to the rear axle, which means that there is a greater tendency to "rear." It was probably a full consideration of both the psychological and mechanical factors involved that induced the Case company to adopt the longitudinal placing of the engine. We are informed that quite a number of different models were built during the past four years and that the present Model L is the outcome of field tests conducted on these various models and of gradual improvements in design based thereon.

Model L has a wheelbase of 79 in., an overall width of 67 in., and a height to the top of the hood of 57 in. The front wheels are 30 by 6 in., and the rear wheels 48 by 12 in. The tractor on which the Nebraska official tests were made weighed 5307 lb. with driver and supplies, so the weight of the tractor itself is evidently close to 5000 lb.

The engine is of four cylinders, having 4⅝-in. bore and 6-in. stroke. The cylinder block and crankcase are in a single casting, but the cylinder liners are made separate and inserted, as has become customary in tractor engine design. Aside from the fact that separate cylinder liners can be replaced at moderate expense if scored or otherwise injured, two additional advantages are claimed for this construction. Since the liners are cast separately, they can be made from harder, closer-grained iron, which evidently offers more resistance to wear. The other advantage is that, since the liners are machined both inside and out, they are of uniform thickness throughout and, therefore, expand and contract uniformly under temperature changes. The cylinder bores are finished by honing.

The crankcase is cast with two large hand holes on each side, and in case it becomes necessary to remove a piston and connecting rod, these may be removed either from the top, after the cylinder head has been taken off, or through one of the hand holes in the case. The cast-iron pistons are fitted with three compression rings and one oil ring, all above the piston pin. At the big end of the connecting rod the babbitt is cast directly into the steel of the rod and cap.

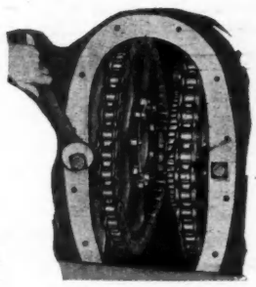
Lubrication of the engine is by the pressure system. A gear type of pump is bolted against the upper part of the crankcase from underneath and is driven from the camshaft through helical gearing. The pump feeds oil under pressure through pipes to the main crankshaft bearings. From these bearings the oil passes through holes drilled in the crankshaft to the crankpin bearings, and through holes drilled in the crankcase to the camshaft bearings. The pump is submerged in oil near the center of the sump, hence it is always primed. It is provided with a pressure-regulating valve and it draws in oil through a fine-mesh strainer of bronze wire. This strainer can be readily removed for cleaning by loosening three cap screws on the outside of the crankcase. The crankshaft is supported by three



Right side view of Case Model L tractor

Model L Four-Plow Tractor Longitudinally

of powerplant in former types, years, brings a number of dising and operation.



The transmission of the Case Model L tractor is enclosed in one dustproof housing, yet is accessible as shown in the picture to the left

HELDT

main bearings, with bronze-backed shells.

The valves are located in the cylinder head and are operated from the camshaft in the crankcase through push rods and rockers.

Starting is effected on gasoline, and after the engine has become warmed up, kerosene is turned on. There are, therefore, two fuel tanks, the larger tank for kerosene having a capacity of 26 gal. A Kingston carburetor is used in conjunction with a jacketed manifold of Case design. This manifold has a heat adjustment. All air drawn into the carburetor passes through an air cleaner. Ignition is by high-tension magneto with impulse starter coupling. The starting crank locks in the upright position, so that trash on the field cannot catch on it and it cannot be bent by obstructions. The engine speed is maintained at close to 1100 r.p.m. by a fly-ball governor built into the engine. The governor weights are machined from bar stock steel, and the governor is mounted on two roller bearings and completely enclosed in the engine case. The whole assembly can be readily removed by loosening three cap screws. A single spring draws the governor weights toward the axis of rotation, and this is located outside the engine.

The six-bladed fan and the water pump are combined in a unit which is driven by a 2½-in. flat belt. Two tapered roller bearings carry the fan shaft, one being located on each side of the belt. By turning the fan-and-pump unit around its axis the tension of the belt can be adjusted. The radiator has a fin-and-tube core and cast-iron top and bottom tanks and spacers or side members. A screen protects the front of the radiator core against trash, and an adjustable canvas curtain is also furnished, to enable the operator to maintain the engine at the proper temperature in cold weather.

A Twin-Disk clutch is used and is hand operated. In choosing between foot and hand-operated clutches, the engineers of the Case company were guided by the considerations that with hand operation the load can be picked up more smoothly; that there is no danger of the clutch slipping into engagement and starting the tractor when it should be standing, and that the hand lever can be easily manipulated while the operator is standing on the ground.

The transmission gives three forward speeds, which adapts the tractor for a wide variety of farm work. The low speed is 2½, the intermediate speed 3¼, and the high speed 4 m.p.h. Most plowing work is done on the intermediate speed. Clutch, transmission and drive gears and chains are enclosed in a cast-iron housing which bolts to the engine block and forms the rear axle center housing. All shafts are supported in this housing on anti-friction bearings. The final drive to the live rear axle is by roller chains. Following are the reasons given by the Case company as to why it adopted the chain drive:

1. Wear is less on sprockets than it would be on gears. The wrapping of chain around a sprocket brings more teeth into contact to carry the load, which reduces both strain and wear.

2. The pull on the chains is in the same direction as the push of the drive wheels in propelling the tractor. This tends to keep the axles in alignment, while a spur gear drive tends to angle the axles.

3. Chains, being somewhat flexible, absorb shocks of starting and sudden loads, while gears do not.

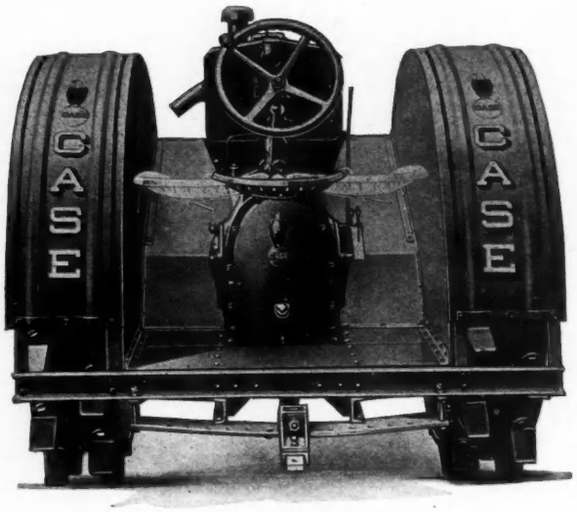
4. Chains, when lubricated and

The above photograph shows the left side of Case Model L tractor

operated on correct form of sprockets, prove by tests to be highly efficient in transmitting power. Less power is lost through friction.

5. Experience has proved that for heavy-duty machines chain drives give superior service even when exposed to the dirt. On the Case tractor they give even better service, since they are entirely enclosed and run in oil.

The drive wheels are of the built-up type with flanged and grooved rims and flat spokes, which are upset where they pass through the rim and are riveted securely over on the outside. The spokes are double riveted to solid one-piece hubs. The wheels are equipped with steel spade lugs hardened on wearing surfaces and secured with two bolts each.



Rear view of Case Model L tractor

The belt pulley, which is 13 in. in diameter by 8½ in. wide, is located on the right side of the tractor. It is said to be easy to line it up with belt-driven machines, because of the long, straight hood, which the operator can use for sighting. At a speed of 780 r.p.m. of the belt pulley, which corresponds to 1100 r.p.m. of the crankshaft, the belt speed is 2650 ft. p. m. The face of the pulley is turned with a crown. There is plenty of belt clearance below and on both sides. For most kinds of belt work the belt is crossed, this giving a greater arc of contact between belt and pulley, permitting less tension on the belt without slippage. The direction of rotation of the pulley is such that its top face moves forward.

A brake is provided on the belt pulley, which is applied by pushing the clutch lever forward as far as it will go. This is used to bring belt-driven machinery to a quick stop in case of accident, as a clutch brake to facilitate gear shifting, and, if desired, for holding the tractor in position on grades, which requires, however, that the gears be in mesh. There is, however, another brake on the transmission which can be used to hold the tractor from running down hill under all conditions.

The front axle is of I section, with reversed Elliott steering heads, and is arched at the middle where it swivels on a bracket formed integral with a casting bolted to the front end of the engine and which supports the radiator. Radius rods extend from points on the front axle center about two-thirds the way out to a bracket at the forward end of the transmission housing.

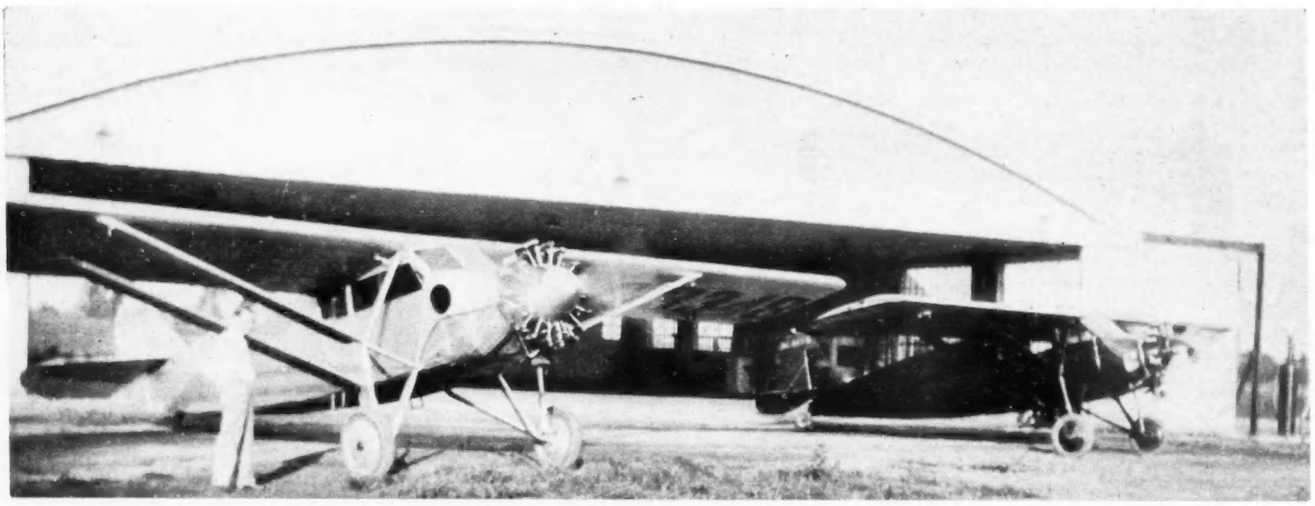
A feature of the tractor is its short turning radius, viz., 13 ft. The steering gear is assembled on the cover for the transmission case, so that the worm and sector mechanism receives lubricant from the transmission. The steering wheel, which has a corrugated rim and a knob, is centrally located and moves the front wheels from the central position to the limiting position either right or left in two complete turns of the wheel. Front wheels are mounted on roller bearings and come regularly equipped with skid rings.

A low, substantial platform is supported on channel irons bolted to the transmission housing on both sides. Full fenders and aprons ahead of the platform are included in the regular equipment.

The seat is of the plow type and can be swung to either the right or the left from its normal central position, and can also be adjusted in the fore and aft direction. The roomy platform (22 by 39 in.), together with adjustable seat, enables the operator to either sit or stand on the machine in comfort. The platform is only 20 in. from the ground and can therefore be easily mounted.

A power take-off, which is furnished as an extra, has its rear driving end located substantially midway between the driving wheels 32½ in. from the ground. The shaft end is 1⅜ in. in diameter and splined; it turns in a clockwise direction at 550 r.p.m.

E. L. Cord Uses Airplanes for Interplant Trips



Above are pictured two Stinson cabin monoplanes which E. L. Cord, president of the Auburn Automobile Co., uses for interplant trips. The plane to the right is a six-passenger and that to the left is a four-passenger. Jack Kelly, a well-known air mail pilot, is in charge of the air operations

THE FORUM

Moskovics Replies to Rickenbacker on New Indianapolis Race Rules

Editor, AUTOMOTIVE INDUSTRIES:

It is with considerable interest that I have noted Captain Rickenbacker's reply to my criticism of the racing rules, and in the immortal words of the citizen of Great Britain, "I take my pen in hand to reply to it," although I do not want it to appear that this discussion should be endless, nor a debate, and I fully appreciate the fact that it can be.

Now I note Captain Rickenbacker says: "What of it?" If, therefore, his argument that freaks are a good thing, and that today's freaks are tomorrow's standards, then, why in the world, have any restrictions?

If large power motors without superchargers are more economical than smaller bore motors with superchargers, why put in displacement restrictions? In other words, if a little admission to freaks is right, then a great deal more should be more right, so let's make it a real freak race. And, I ask in all humility, doesn't Captain Rickenbacker's own statement answer perfectly how far afield the rules have wandered from any semblance of stock cars?

Having wagered with Captain Rickenbacker before, I will be perfectly willing to wager with him again, and accept the proposition he makes that if such a car starts, I bet him it finishes; notwithstanding the fact that he well knows picking any car in the Five Hundred Mile Race to finish is a long shot gamble because of the fact that there are so many elements, that design and speed have nothing to do with, over which the driver and the excellence of design have no control.

I note Captain Rickenbacker's intimation of my knowledge how to take advantage of racing rules, and I feel that is a little outside of the question, although I respectfully protest that to my knowledge I never took an unfair advantage, and never yet went beyond the spirit of the rule in any race that I had anything to do with. I keenly regret the injection of this personal angle into a discussion that academically, at least, should be impersonal.

Costly Car Could Qualify

His invitation that I promote a racing team is not well taken and seems to me a very weak argument, as I indicated clearly that I have no interest in any automobile at the present time, but if I were the head of a large corporation with a liberal advertising appropriation to spend, I am very certain that I could lay out an expenditure of one hundred and fifty thousand dollars, and for this sum lay out a car that would have an untold advantage over the other competitors. And even Captain Rickenbacker's argument against this is that it won't be done, not that it can't be done under the rules.

You will note, I, too, pointed out that it puts a premium on drivers for being good promoters. With all due respect to Captain Rickenbacker's compliments to me as a promoter, I have never yet been a promoter.

I did not say anyone would spend $150,000. I merely pointed out the doors were wide open to anyone who could spend that amount. In other words, a premium has been placed on expenditures. Surely that is no way to make racing cheaper. What I pointed out was that it opens the loophole for the man that has a lot of money to spend to have a decided advantage over the man that has not. This he seems to admit himself.

Low-Speed Blowers Are Practical

Of course, Captain Rickenbacker, in his analysis of blowers, refers to blowers running 30,000 r.p.m. There are plenty of blowers that do not have to run at 30,000 r.p.m. There are blowers that are running at engine speed, or twice engine speed. If that is the only argument, they could have easily limited to twice engine speed blowers; so it is absurd to discuss that—and Captain Rickenbacker's own statements in the beginning of the article answers his own arguments on this point.

More than two valves per cylinder have been quite commonplace in production in Europe and America. There is a car in production in America today built with more than two valves per cylinder. I have no interest either in that, or cars with superchargers, but I have an interest in the normal trend and development of design, and it seems to me for any body of men to sit up and attempt to direct the channel in which an engineer should train his mind is beginning to assume some of the powers of a far-seeing Divine Providence.

Can you or can I say that low pressure superchargers are not a good thing? Are you prepared to guarantee that the development of two valves per cylinder on the inlet or exhaust is not and could not be a good thing? Fred Duesenberg is no amateur, yet he utilized more than two valves per cylinder, and, certainly, I will not admit the gentleman who put out the rules knows more about the future requirements than he does. Yet, they are definitely and positively ruled out.

Pick out all the things an engineer can do for the future, and the rules cater and encourage, what? Front wheel drives, four wheel drives, independent springing of wheels, and a tremendous other field of freak designs which are much farther reaching as freaks than the two things which are ruled out. That is my objection.

Captain Rickenbacker draws from my objection that I spoke of a supercharged four-valve job, which is highly

specialized. It did not at all. It may be three valves. It may be, and probably will be, a supercharger without a plurality of valves, but I really do not admit that anyone has a right to bar those two things out and admit all the infinity of freak designs.

I think the results of racing in Europe and America with a driver and no mechanic, answer clearly Captain Rickenbacker's reasons for having a mechanic in the car, and certainly I believe the dangers to that mechanic far offset the reasons given for his use. And, as to the reason that it is a post-graduate school for training on the board speedways, please tell me what board speedways? I hardly presume that they are going to race at Altoona again after what happened there? Salem, I understand, is not in much better shape. Atlantic City has abandoned racing, so what other board speedways are they going to prepare for? I believe the development of such drivers as Louie Meyer and George Souders, the late Frank Lockhart, and many others who arose from the ranks since the one-man car came into vogue, answers whether the one-man car drivers can be developed or not without putting them through this dangerous, hazardous, needless test.

LeMans Has Model Rules

Regarding the tremendous Solomic requirements of defining the stock car, it was not my intention, if the article is read carefully, to attempt that. I believe, without looking over the article, that I used the term "modified stock car," and I clearly stated that the LeMans race has given a perfectly good history for doing that. A careful study of the LeMans race would have helped the rule makers very much.

Captain Rickenbacker brings up the fact that the only reason there is no restriction on fuel and lubricants in the cars is due to the fact that fuel is less expensive in this country than in Europe, but does that answer the fact that it is just as inconvenient to stop and fill cars of this country while on tour as it is in Europe? That is the biggest advantage of it, and the same answers for oil.

I subscribe perfectly to Captain Rickenbacker's statement that you can test an electric starter in a laboratory, but I also claim that you cannot test the method of fastening that starter and the method of fastening all the fittings of that starter in the laboratory, and the same is true of the gas line and all other parts, and I submit, in all fairness, that that is exactly the trouble with a great many of our automobiles. There has been too much of this work done in the laboratory, and not enough under actual road conditions, to the detriment and disadvantage of the owner when he gets out on the road. Some day, somehow, one of these laboratory tested cars will see the light of day, and the Indianapolis Speedway, with its marvelous course for just this sort of thing, has been the best testing grounds in the world for them.

Drivers' Opinions Unanimous

In ceasing, I submit, as a whole, that practically every racing driver in America is unanimous in the opinion that the rules will not accomplish the six-fold objects that Captain Rickenbacker indicates after all the rules were made for their benefit; yet, is Captain Rickenbacker prepared to say they are all wrong, and only the rule makers right?

I have gone over hastily Captain Rickenbacker's reply without any attempt to be a debater, but I believe, in fairness, that the matter should be understood in all its phases.

Once more, let me say I keenly regret the injection of personalities in this discussion. I have a high regard for Captain Rickenbacker and his attainments, and I had hoped, and still hope, that he will realize my only object in this criticism is to create a healthy discussion on the subject, which, in the end, must be beneficial to racing as a whole, and to the Indianapolis Speedway in particular.

Very truly yours,
F. E. MOSKOVICS,
Improved Products Corp., New York, N. Y.

Aug. 19, 1929

Superchargers Essential

Editor, AUTOMOTIVE INDUSTRIES:

Your letter of Aug. 8 received together with inclosures, and, in reading over the contest rules, it appears that this would allow cars of a freak design to be entered and of such a type that their performance would not mean anything to the automobile industry as a whole. As a suggestion I believe it would be well to require entrants to file with the contest board, specifications of the car they expect to enter before the entry is accepted and if specifications were not approved, entry could be rejected. This would prevent cars of the type before mentioned from entering the race.

I also believe that if motor car manufacturers are going to enter their cars they should be confined to units that they are using in their current production but they should have the right to modify these units, to meet racing conditions, and I certainly do not believe in barring the supercharger. While it is true that superchargers in use are not practicable for production cars, there are now in experiment superchargers which can be and will be used on stock cars.

With reference to carrying a mechanic, I believe this should be done for two reasons: first, to train the race driver of the future, and also to act as an observer of the performance of the units of the car.

The question of valves should be left to the discretion of the builder as there is no question in my mind that production cars will in time use more than two valves per cylinder, as I know of experiments, made in the past few years, which show that motors equipped with either three or four valves per cylinder have decided advantage over the same motor with two valves per cylinder and are not complicated or hard to service.

As to the cost of building special jobs being greater than the prize money they would receive, there are firms who would gladly pay the price and rely on the publicity they would receive to balance the loss sustained.

Very truly yours,
MEL STRINGER.

Aug. 12, 1929.

For Faster Racing Machines

Editor, AUTOMOTIVE INDUSTRIES:

Thanks for your letter of Aug. 8 regarding the rules for the 1930 Indianapolis race.

My opinion may mean very little, but from years of experience as a race driver (I drove a Pope in the first 500-mile race—Indianapolis—1911); a speedway promoter (Uniontown, Pa.—1916 to 1922); an A.A.A. official, allow me to state that all rules of any contests in the past or those to be decided in the future, must be drawn up with the idea first and always in mind that the promoters conducting such a contest will cover expenses and make money if possible.

A real, strictly stock car race never has been or never will be a howling financial success. In the days gone by, stock car races were always considered more or less as a joke, as no entrant ever lived up to the rules. Officials and speedway promoters are aware of this fact, hence the latitude of the rules covering the 1930 Indianapolis race. You must admit that the rules governing this race take a lot of ground—practically every sort of car will be allowed to start but a real fully equipped stock job.

The Minerva Co. had intentions of entering two cars in the 1930 Indianapolis race, as it was my understanding that the race was to be just a stock car proposition. I wired Indianapolis on June 1 for information. A few days later I received a copy of the proposed regulations covering next year's race, and after reading them over carefully we immediately cooled off, as it would be necessary for us to build up two new special jobs and parts if we had any intention of at least finishing among the first ten cars.

Put me down as prophesying that the spectators for the 1930 Indianapolis "stock" car race will see faster and better racing machines than ever before.

Probably after this race the question will again arise as to the possibility of conducting a stock car race in 1931. This, of course, is a long way off and we can go into details later.

Very truly yours,
NEIL WHALEN,
Minerva Automobiles, Inc.

P. S.—My suggestion would be, put on a strictly stock car race at 100 miles the day before the regular 500-mile race. In this way the promoters can ascertain if the people care for this type of racing, and it will also serve as an appetizer for the big race the day after. The main objective is to get the various manufacturers of pleasure cars interested.

Aug. 14, 1929.

Sees Use for Stock Races

Editor, AUTOMOTIVE INDUSTRIES:

Your letter of Aug. 8 was received during the writer's absence on vacation, all with reference to the pros and cons concerning the rules of the 1930 Indianapolis race.

I am afraid that any of my opinions relative to this matter would not be worth much, because, in the first place, I am not a race fan, and, as a result, I really do not take very much interest in it. It seems to me, however, that the Indianapolis Speedway could be used advantageously in three ways. First, as a course over which cars embodying new designs and new construction can be operated in order to determine both efficiency and life. It seems to me that such trials could be made by the manufacturers of such cars or devices. In fact, I think the speedway is already being used for this purpose.

I should also think that the next good use for the speedway would be in the running of stock car races, but I imagine that the manufacturers of automobiles would hesitate very much in engaging in such races because some one model always wins and other models lose, so that not much advertising capital can be made out of the result.

Third, I think a speedway can be used as a sporting track, and I am much inclined to think that this is probably the use which will show the greatest remuneration. Personally, I have no particular interest in its use as a sporting track, but then I know I am in the minority in this respect.

Very truly yours,
T. F. CHANDLER,
Vice-president, Ross Tool & Gear Co.

Aug. 16, 1929.

Hopes to Compete in 1930

Editor, AUTOMOTIVE INDUSTRIES:

This is in answer to your letter of Aug. 8, regarding the rules for the 1930 Indianapolis race.

As a former driver in this event, I, of course, have been keenly interested in the proposed change, have received all A.A.A. bulletins on the subject and have read all pros and cons.

The comments of Mr. Moskovics and Captain Rickenbacker are, I believe, the answer I wish to express; I am 100 per cent for each and every thought as expressed by Captain Rickenbacker. The change is necessary, and I sincerely hope to compete in the 1930 race under the new rules as adopted by the Indianapolis Motor Speedway.

Very truly yours,
JULES ELLINGBOE,
Stutz Motor Car Co. of America., Inc.

Aug. 16, 1929.

Would Limit Race to Stock Cars

Editor, AUTOMOTIVE INDUSTRIES:

With reference to your letter on the subject of specifications for racing automobile equipment, I would advise that my reaction is that the data derived from racing would be of more value to the automobile industry if the rules were changed to limit the race strictly to stock cars.

Yours, very truly,
T. V. BUCKWALTER,
Vice-President, The Timken Roller Bearing Co.

Aug. 15, 1929.

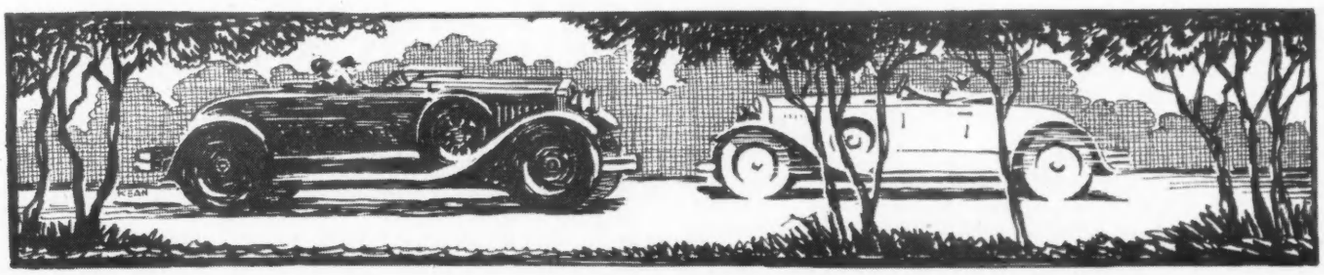
Agrees With Rickenbacker

Editor, AUTOMOTIVE INDUSTRIES:

I am in full accord with the new rules and with Mr. Rickenbacker's views, especially since I was a member of the committee that formulated them.

Very truly yours,
S. G. BAITS,
Chief Engineer, Hudson Motor Car Co.

Aug. 12, 1929.

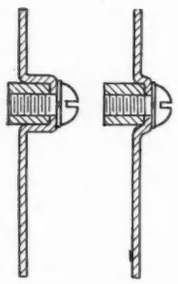


NEW DEVELOPMENTS—Automotive

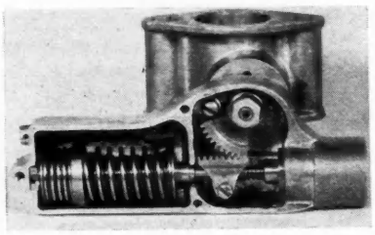
Monarch Dual Force Governor

AN interesting new governor for internal combustion engines, the "Dual Force," has been announced by the Monarch Governor Company of Detroit.

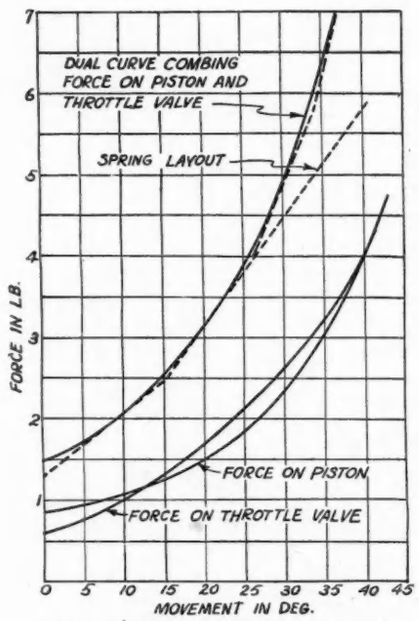
In principle it combines the features of piston-operated and offset-butterfly types of governors. The combined forces on piston and valve are said to develop a better curve than is produced by either force alone, as is indicated by the graph reproduced herewith. It also makes possible the use of a smaller piston and of a lesser offset of the valve. Keeping down the offset of the valve tends to make impossible "racing" of the engine by manipulation of the throttle or choke.



METHOD OF CHANGING VALVE OFFSET.



Monarch "Dual Force" engine governor


DUAL CURVE COMBING FORCE ON PISTON AND THROTTLE VALVE
SPRING LAYOUT
FORCE ON PISTON
FORCE ON THROTTLE VALVE
FORCE IN LB.
MOVEMENT IN DEG.
0 5 10 15 20 25 30 35 40 45
1 2 3 4 5 6 7

Curves of spring pressure and of gas pressure on throttle and piston

The design and calibration of the governor are such that the forces on piston and valve are approximately equal as the valve approaches the closed position. A plurality of springs oppose this dual force, and are flexibly connected by a rod to the piston in a straight line. The valve force is transmitted to this rod through a gear sector and rack, as shown in the illustration. Four springs oppose this dual force, and these are calibrated and so arranged that they come into action consecutively and produce a force approximating the gas pressure force for all positions of the throttle. Moreover, the two inner springs which govern the idling speed, and the two outer springs, which govern the full load speed, are independently adjusted by a single adjustment as will also be noted from the illustration. The screw adjustment acts initially on the two outer springs which abut the adjustment support, until they reach a predetermined point where the inner idle speed springs are taken up, and this is the point where the full load speed begins to exceed the low load or idle governed speed.

This makes possible a greater speed range adjustment than is permitted by the usual type of adjustment. The inner and outer springs are independently mounted, but are both anchored to steps on a flange, which is slideably mounted on a tube, within which tube the rod operated, connected to the piston. This tube is held in place by the governor cover, and the mechanism can be readily assembled or disassembled in the housing without its removal from the engine, by simply removing the cover.

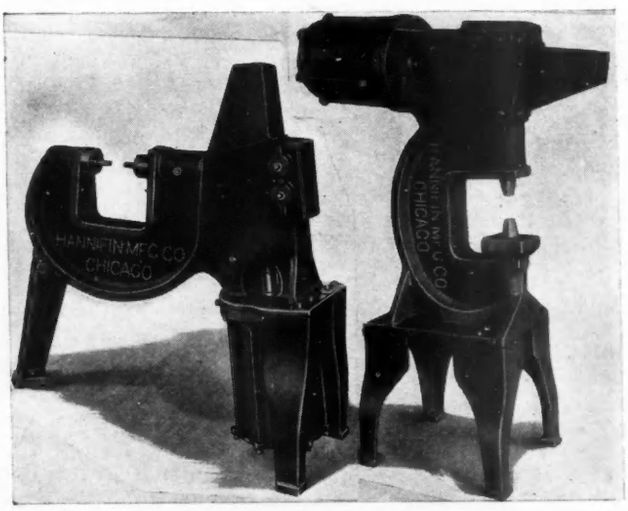
The employment of a square shaft for mounting the butterfly valve is an original feature. The shaft is rounded at both ends to form bearing journals and oilless bearings are employed, the front bearing extending beyond the governor body to serve as a pilot for the housing. The square design of valve shaft makes possible a variation in the valve offset without changing the shaft location. This also effects quite a saving, it is said, by eliminating the necessity for milling off the valve shaft.

Air-Operated Rivet Press

AN air-operated rivet press for which simplicity of design is claimed as the chief feature is announced by the Hannifin Manufacturing Co. of Chicago. The ram is the only moving part in sight, and there are only five points requiring lubrication.

The main frame casting is made of open hearth steel, in one piece. No leather packings are used in the air cylinder, and the piston can be adjusted from the outside to compensate for wear.

The press operates on the wedge principle, a wedge being driven between two standard roller bearings mounted in the frame and a roller mounted in the top of the ram. Forward movement of the air-cylinder piston drives the wedge between the rollers, causing downward movement of the ram. The wedge is made in two



Hannifin air-operated rivet press in the horizontal and vertical forms

Parts, Accessories and Production Tools

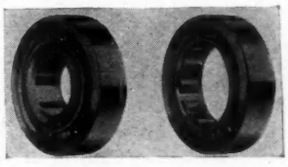
steps, the first part having a steep angle and giving a rapid initial motion of 2 in. to the ram. At this point the angle becomes much smaller and the last 1 in. of ram motion is accomplished at much lower speed, to give greater power.

It is claimed for the Hannifin wedge-type rivet press that it forms a perfect rivet head in a single stroke. It can be used for heading either hot or cold rivets. A tight joint is claimed to be produced regardless of the length of the rivet, because the power stroke is longer than actually required. The presses illustrated are in use on production work in a large implement factory.

Although these presses are designed primarily for riveting operations, they can be used also for other operations requiring great pressure through a short range, such as punching, perforating and assembling operations. Machines of the vertical type are available in 13 sizes ranging in pressure from 5000 to 8000 lb. and of the horizontal type in eight sizes with the same power range. Two portable types are also available, with capacities of 10,000 and over 20,000 lb. respectively.

Hyatt Solid Roller Bearings

TO satisfy a demand for roller bearings interchangeable with S.A.E. standard single-row ball bearings but of greater load capacity, the Hyatt Roller Bearing Co. of Newark, N. J., has placed in production a series of what it refers to as single-row radial roller bearings. This new line is not intended to replace the standard Hyatt roller bearing, which uses spirally wound rollers, but is offered as a supplement to it, for installations where space limitations prevent the use of the flexible roller bearing and where loads have to be carried that are beyond the capacity of the ball bearings that can be accommodated.



Hyatt single-row radial bearing assembled with inner race and (left) with the inner race removed, to show roller construction

The design employed is one in which the rollers are permanently retained with the outer race, the inner race being separable. A separator, floating on the rollers, spaces them properly, and heat-treated end rings retain them endwise within the outer race. The end rings and separator function to keep the rollers in proper alignment, insuring positive contact along their full length. This full line contact of the rollers, the Hyatt company states, enables their single row radial bearings to sustain greater loads than can safely be carried by ball bearings of equivalent sizes which have only spot or point contact between balls and races.

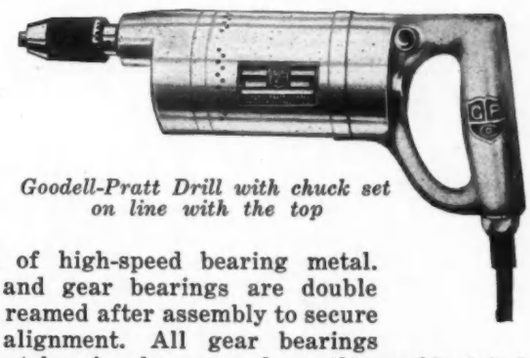
The rollers and races of this bearing are made of chrome-nickel steel, and the end rings are of vanadium steel to minimize wear by the ends of the rollers. The roller separator is made with the pockets parallel and equally spaced, to assure uniform load distribution on the rollers.

The bore, outside diameter and width of Hyatt single-row radial bearings correspond to standard S.A.E. metric dimensions. They are therefore interchangeable with all single-row ball bearings of equivalent sizes, providing greater load capacity within the same space. The roller ends are sufficiently rounded to facilitate assembly where the inner race is not used, and both the outer and inner races are chamfered at one end.

Goodell-Pratt Electric Tool

GOODELL-PRATT CO., Greenfield, Mass., recently has brought out a new electric drill which has a chuck set on a line with the top of the drill, thus permitting close-up drilling against walls or other projections. The internal construction of the chuck is such that the jaws are self-tightening; the greater the torsional strain exerted on them by the drill, the tighter they grip.

Ball breakage is eliminated by dispensing with ball bearings except in the thrust, and using long sleeve bearings of high-speed bearing metal. Spindle and gear bearings are double end, line reamed after assembly to secure perfect alignment. All gear bearings are of best bearing bronze and are thoroughly lubricated by grease.



Goodell-Pratt Drill with chuck set on line with the top

These new drills are being made in 1/8, 3/16, 1/4 and 3/8 in. heavy duty, 1/2 in. light duty, 1/2 and 9/16 in. standard, 1/2 and 5/8 in. heavy duty and 7/8 in. standard sizes. Drill stands, bench clamps and special arbors for holding grinding wheels, scratch brushes, etc., are also furnished.

Hannifin Broaching Press

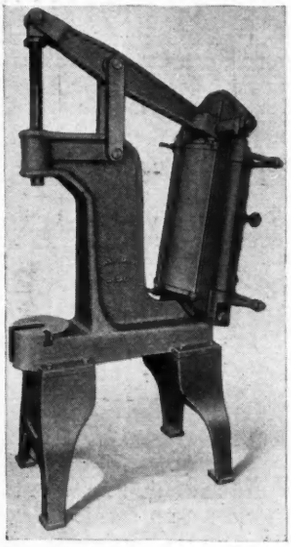
A NEW and rapid method of broaching comparatively short holes has been developed by the Hannifin Manufacturing Co. of Chicago.

In the past it has been considered impossible to use air-operated presses for broaching operations, because of the great speed at which the ram travels, which would cause the broach to plunge into the hole and break. This difficulty has been overcome in the new Hannifin press by a novel application of hydraulic speed control.

As will be noted from the illustration, two small hydraulic cylinders are mounted on opposite sides of the air cylinder. The piston rods of the hydraulic cylinders are connected to the piston of the air cylinder by means of a cast steel cross arm. Speed control is accomplished by regulated transfer of oil from the top to the bottom of the oil control cylinders. During the

power stroke the oil is compelled to pass a needle valve which can be set to permit any desired speed. During the return stroke the oil passes through a swing check, thus permitting the ram to return to the top position at full speed.

The hydraulic speed control is said to result in perfectly uniform travel of the ram at any desired speed and without loss of power. The cost of the equipment is said to be much less than that of a full hydraulic broaching press and its operation is faster, but the hydro-pneumatic broaching press can be used only on operations which can be performed with broaches not exceeding 12 in. in length. As an example of uses of this new broaching press it is stated that a manufacturer of hydraulic shock absorbers broaches a hole 9/16 in. in diameter and 1 in. long in the cast iron body of the device. This hole must be straight, round and very smooth, and must be held to very close limits. It is now broached on a Hannifin hydro-pneumatic press at the rate of 623 per hour in an all-day run.



Hannifin hydro-pneumatic broaching press

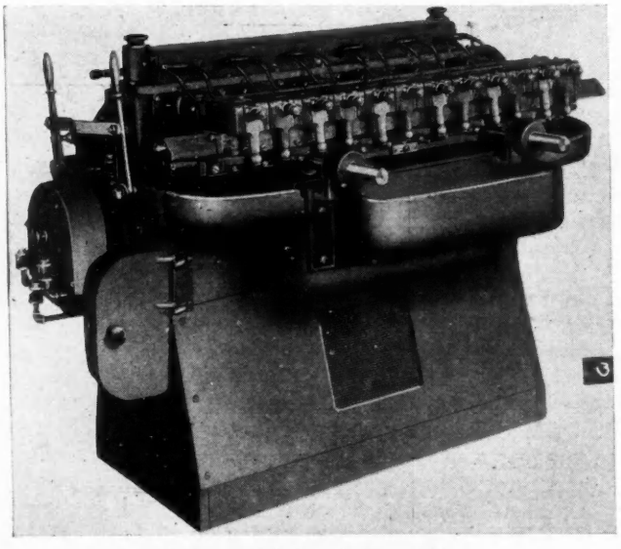
Multiple Spindle Driller

THE Kent Machine Co., Cuyahoga Falls, Ohio, has recently brought out a new multiple-spindle driller which can be adapted not only for drilling several pieces during one cycle of the machine, but also, by the use of a cluster drill head, for drilling several holes in each piece.

While the machine is similar in design and operation to the standard No. 1 six-spindle horizontal driller which has been manufactured by this company for some time, it is larger and heavier in construction and contains many new features in addition to the cluster drilling mechanism. The driller is manufactured with six single spindles on 7½-in. centers or a series of six units of specially designed cluster drill heads with the same center distances. Either motor or belt-drive is furnished. When motor-drive is employed the motor is located on a movable angle plate in the base of the machine and is quickly and easily adjusted for change of speed or for tightening the silent chain.

The production of the machine is governed by the revolution of the camshaft, which is controlled through a series of change gears and adjustable dogs. By this combination it is possible to synchronize the speed of production with the ability of the operator to feed the parts to be drilled to the fixtures. The feed of drill per revolution is controlled by a feed cam which may be varied in speed at will by the change gears which control the camshaft.

Twelve fixtures are required, two being used in connection with each drill head. These fixtures alternately occupy positions in front of and between the drill heads. When in line with the drill heads the fixtures are automatically locked, thereby securely holding the work for the drilling operation. In the alternate position the fixture is opened, which allows the operator to remove the previously drilled parts and load the fixtures for the next operation.

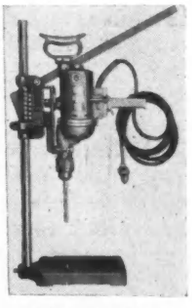


Kent multiple-spindle driller

"Wodack" All-Purpose Drill

THE new "Wodack" all-purpose portable electric drill, made by the Wodack Electric Tool Corp., 4627 West Huron St., Chicago, possesses features not usual in portable drill design.

It has a General Electric motor of ample reserve power built in for direct or alternating current of 60 cycles or less, 110-125 or 220-250 volts as desired. An oversize double-pole trigger switch in convenient position insures long life. High-grade ball and roller bearings are used, the heavy thrust loads being carried by Timken roller bearings. Hardened gears are simply assembled, grease compartments are designed for long periods of operation, and correct ventilation is provided for by an oversize fan for quick cooling during idle running.



Wodack Drill

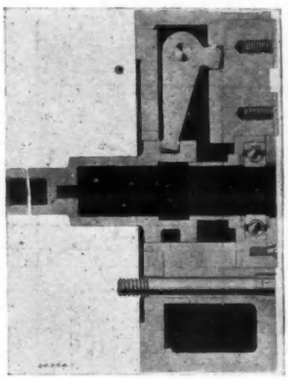
Capacity—steel 0-⅝ in., wood 0-2 in., depending on kind and depth required.

Ball-bearing Pilot Bushing

WITH the feeds and speeds employed in modern production, many boring operations call for careful piloting of the boring tools. Heretofore rigid or non-rotating pilot bushings have been mounted in the center of the chucks. Obviously, a close feed is required, resulting in a great amount of friction. Lubrication is of very little help, particularly in view of the fact that chips and dust are bound to find their way in between

the pilot and the bushing, resulting in galling and seizing.

The Hannifin Manufacturing Co. of Chicago now equips its air chucks with ball-bearing pilot bushings, as illustrated by the accompanying sectional view. The hole in the inner race of the ball bearing is ground accurately to size to accommodate the pilot and the boring tool. When the pilot moves into the hole in the bearing the inner race remains stationary while the outer race of the bearing rotates with the chuck. We are informed that two manufacturers of large turret lathes employ this air-operated chuck wherever boring operations require pilot bushings.



Hannifin air-operated chuck with ball-bearing pilot bushing

Tungsten Carbide Tools

A NEW tool of the tungsten-carbide type soon will be placed on the market under the name "Haystellite." A modification of the original alloy has been found to be valuable as a cutting metal, and laboratory and shop tests (the latter in a few of the largest production shops in the country) have been in progress for several months.

Most of the tungsten-carbide tools at present on the market are prepared by the sintering process. Haystellite is different from these in that it is a cast alloy, made by a special process. As its name indicates, Haystellite is made and sold by the Haynes Stellite Co., but it is not Stellite and differs radically from the latter in composition.

The alloy, in so far as cutting tools are concerned, is in the final development stage but the final tests and the manufacture of an initial stock of standard tools will be completed so that tools may be placed on the market some time during the latter part of this year. At the present time the manufacturer is not in a position to furnish sample tools, but expects to be able to do so in the near future.

G. & L. Twist Drill Sharpener

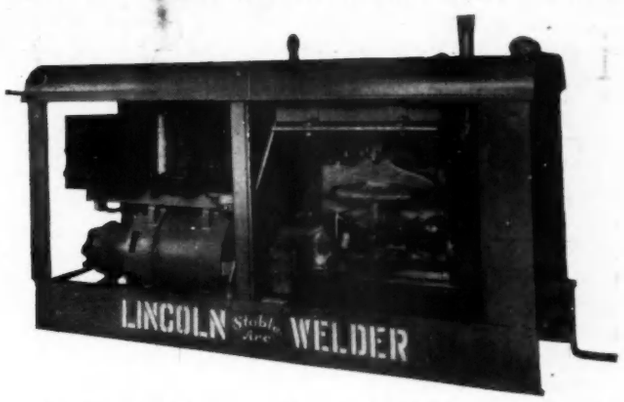
GALLMEYER & LIVINGSTON CO., Grand Rapids, Mich., recently have developed a machine for sharpening twist drills with a maximum capacity of 5 in. It is of the double holder type, making it possible to grind drills from No. 52 up to 5 in. Both holders are of the non-calipering type on which it is possible to change from sharpening one size drill to another without taking any time for preliminary adjustments. It is also possible to switch from grinding a straight shank drill to grinding a taper shank drill, and from grinding a two-lip drill to grinding a four-lip drill without any preliminary adjustments.

Smaller drills are ground dry on a fine grain wheel on one side of the machine and large drills are ground wet on a coarser wheel on the other side. A 1½ hp. motor is built into the head of the machine to form an integral part of the grinder.

Lincoln Welder

THE Lincoln Electric Co., Cleveland, Ohio, has introduced to the trade a new model engine-driven welder for use where electric current is not available. The new model welder is of 200 amp. N.E.M.A. rating and is powered by a four-cylinder Waukesha engine, operating at 1500 r.p.m.

Several improvements are featured in this gas-engine driven welder. An idling device is incorporated which automatically reduces the speed of the engine when welding operations cease, and automatically accelerates the engine to the proper speed as soon as welding is started.

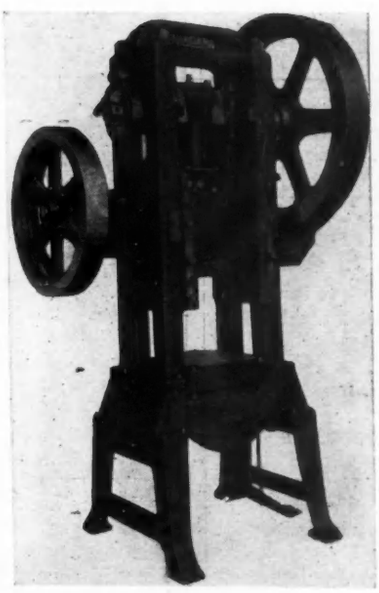


Lincoln electric arc welder equipped with generator driven by Waukesha engine (shown with its steel canopy)

Complete protection is afforded the machinery by the welded steel canopy which totally encloses the outfit. Unified control, a feature of all "Stable-Arc" welders, is also incorporated in this new model. Operating controls are enclosed in a ventilated steel cabinet.

Niagara Power Press

TWO new single crank power presses of the four-piece-steel-tie-rod-frame type, Nos. 54 and 56, have been added recently to the line of the Niagara Machine & Tool Works, Buffalo, N. Y. These presses can be furnished either plain or single-back-geared, and either in the belt-drive or the motor-drive type.



Niagara single crank power press

These presses are adapted for the manufacture of watch and clock parts, small automobile hardware, radio and electrical parts, small armature blanking, etc. The presses have rated capacities of 35 and 55 tons respectively and are therefore of the proper size for many of the smaller drawing operations. They are said to be well adapted also to large and small blanking jobs.

First with the News

Reliable, Accurate

News of the Industry

PAGE 278 VOLUME 61 *Philadelphia, Saturday, August 24, 1929* NUMBER 8

Five Million Units Seen As 1929 Production Total

DETROIT, Aug. 19—Automobile production during the last several days has shown a slight advance over the first half of the month, when the factories, taken as whole, showed increased activity compared with July as well as a considerable advance over the level of last year. With the continuation of the long-sustained demand in the field, and the consequent high production thus far this year, early predictions of 5,000,000 automobiles and trucks in the United States and Canada for the twelve months have been generally revised upward.

Production during the first seven months of this year has been estimated as 3,920,000 units, and in the absence of any indication of widespread curtailment in the industry as a whole, estimates for the year's output have been placed at 5,500,000 in many quarters, while mention of 6,000,000 units as the possible showing of the entire industry for the year is by a number of experts considered possible in view of the huge increases in export business.

Taking an estimate of 500,000 cars and trucks for August production, a figure considered conservative by several students of production trends, and adding this to the estimated production of 3,920,000 units for the first seven months of the year, gives the tentative figure of 4,420,000 cars and trucks for the first eight months of the year.

This would leave 1,080,000 units to be produced in the last four months in order to bring the total for the year to 5,500,000 for the entire industry or an average of 270,000 units. This would compare with an actual output of 1,364,777 units for the last four months last year.

While, of course, it is too early to predict the extent of possible curtailment in the last four months of this year, such being dependent upon the demand for the field, the opinion that it will be sufficient to bring the year's total below 5,500,000, is rare.

Employment in Industry Drops

WASHINGTON, Aug. 22—Activity in the automotive industry showed slight curtailment during the month of July but the recession was not as great as in former years, according to a report of the monthly survey of industrial conditions throughout the United States just made public by the Employment Service of the U. S. Department of Labor.

B. B. Bachman

who has been elected vice-president in charge of engineering of the Autocar Co.

Lindbergh Tests Condor

ROOSEVELT FIELD, L. I., Aug. 20—Colonel Charles A. Lindbergh, technical adviser of the Transcontinental Air Transport, Inc., tested its new 18-passenger Curtiss Condor transport biplane here this morning.

Taking off directly into the wind at 11.15 the experts went through many maneuvers. Colonel Lindbergh made several landings and take-offs in various positions to the wind. Several hundred spectators watched the flight.

He will report directly to the technical committee of the Transcontinental Air Transport.

Autocar Promotes Four Executives

Three Vice-Presidents Added by Board of Directors

PHILADELPHIA, Aug. 20—Robert P. Page, Jr., president of the Autocar Co., Ardmore, Pa., announced yesterday that the board of directors of the company had elected three vice-presidents and a secretary. These officers were: J. C. Taney, former secretary and assistant treasurer of the company, and for the last six years, treasurer, was made senior vice-president, succeeding to the vacancy caused by the resignation of John S. Clarke. H. M. Coale, formerly general sales manager, was elected vice-president in charge of sales. B. B. Bachman, chief engineer, was made vice-president in charge of engineering, and W. H. Brearly was made secretary.

Mr. Bachman is a former president of the Society of Automotive Engineers and is credited with the design of the present Autocar truck. Mr. Brearly was formerly head of the company's legal staff and last year was elected president of the Pennsylvania Automotive Association. He succeeds R. T. Anthony, who resigned as secretary of the company.

At the directors' meeting, which was held yesterday, the regular quarterly dividend of two per cent was declared on the preferred stock or the company. It will be paid Sept. 15 to stockholders of record Sept. 5.

A banking syndicate headed by Prince Whitely & Co., which recently purchased the Clarke interests in the Autocar Co., is reported on good authority to have exercised options on other smaller blocks of outstanding common stock, with the result that the syndicate has nominal control of the company, although the total holdings are believed to be less than a numerical majority. No accurate compilation of the amount of stock so held will be possible until the next stockholders' meeting of the company, when voting rights are exercised.

Autocar Directors Will Not Meet

PHILADELPHIA, Aug. 21—Regarding newspaper reports that directors of the Autocar Co., Ardmore, Pa., would meet next week to discuss plans for re-

financing the company, Robert P. Page, Jr., president, said that most of the pressing business before the directors had been disposed of at a special meeting Monday, and that to his knowledge no other meeting would be held this month. He pointd out that many of the directors were on the point of leaving for delayed vacations, and that it was not likely that any important business would be transacted in the near future.

A spokesman for Janney & Co., bankers interested in the recent purchase of Autocar holdings from the Clarke brothers, founders of the company, said the bankers had no statement to make at this time regarding the banker's plans for the future of the company.

Bellanca Tests New Type of 12-Passenger Airplane

WILMINGTON, DEL., Aug. 21—A new type of airplane, built in secret by the Bellanca Aircraft Corp., was tested here yesterday by Shirley Short, holder of the Harmon Trophy. According to company officials, the new plane is built for long distance flights, its tanks having a maximum capacity of 2190 gal. of gasoline. The main tank holds 1500 gal., the auxiliary 230 gal., and two wing tanks 230 gal. each, giving a potential range of 100 hours on a duration flight.

The ship is of the Sesqui plane type, with a wing spread of 87½ ft., fuselage 25 ft. long and 8½ it. high, and the tail 32 ft. wide.

Budd Merger Denied

PHILADELPHIA, Aug. 21—A report that the Budd Wheel Co. and the Edward G. Budd Mfg. Co. would be merged on the basis of an exchange of stock, effected through the heavy holdings of Donald Alexander, recently elected a vice-president of the manufacturing company, were unofficially said to be without foundation here today. Mr. Alexander was reported to have acquired a $1,300,000 interest in the wheel company earlier in the year from buying stock formerly owned by the manufacturing company. This report, it was said, has no basis.

R. J. Goodman-Crouch

former head of the Airworthiness Department of the British Air Ministry, who has just arrived in this country to establish his residence at Bridgeport, Conn., where he is associated with the Whittelsey Manufacturing Co. as vice-president and chief aeronautical engineer

Final Test to Determine Mercury Schneider Entry

ANNAPOLIS, MD., Aug. 21—The crucial test of the Philadelphia-built seaplane which Lieutenant Alford J. Williams, U.S.N., hopes to enter in the international speed tests off Cowles, England, Sept. 6, is scheduled to take place at 8 o'clock tomorrow morning. It was made plain today by the Navy Department the Mercury must exhibit greater power to take the air than it has already displayed.

In a test today, Lieut. Williams was rendered unconscious for about five minutes from gasoline fumes and reduction of air in the cockpit.

Howell H. Brooks

INDIANAPOLIS, Aug. 20—Howell H. Brooks, 54 years old, formerly general sales manager of the Marmon Motor Car Co., was buried here today. Death, occurring at a local hospital Sunday, was said to have been caused by embolism following a cerebral hemorrhage.

July Production Set at 517,792 Units

Less Than Last Month, Figure is More Than Year Ago

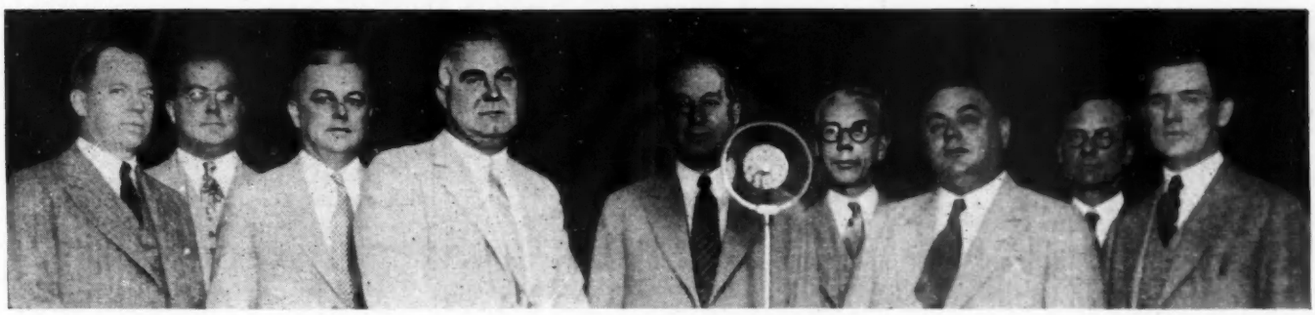
WASHINGTON, Aug. 22—Total July production of passenger cars and trucks in the United States and Canada was 517,792, according to figures compiled by the Department of Commerce from reports of 151 manufacturing concerns in this country and from the Dominion Bureau of Statistics.

July production compares with an output of 417,312 units for the same month in 1928 and with a production of 566,867 units for the previous month of this year. Passenger car production during July numbered 440,813 and truck production 76,979.

The following table is based on the Department of Commerce report and shows revised figures for March, May and June of this year:

	Cars	Trucks	Total
1928			
Jan.	212,351	27,840	240,191
Feb.	301,466	34,834	336,300
March	387,048	43,735	430,783
Apr.	385,394	48,921	434,315
May	405,627	54,098	459,725
June	381,963	43,232	425,195
July	358,914	58,398	417,312
	2,432,763	311,058	2,743,821
Aug.	424,867	67,676	492,543
Sept.	375,463	61,044	436,507
Oct.	353,162	62,658	415,820
Nov.	225,608	43,401	268,909
Dec.	212,727	30,814	243,541
	4,024,590	576,551	4,601,141
1929			
Jan.	366,610	55,927	422,537
Feb.	433,400	64,239	497,639
March	548,256	77,587	625,843
Apr.	573,303	89,934	663,237
May	542,502	93,128	635,630
June	470,513	96,354	566,867
July	440,813	76,979	517,792
	3,375,397	554,148	3,929,545

Associates Present Zeder With Portrait



DETROIT FREE PRESS PHOTO

Officials and employees of the engineering division of the Chrysler Corp. Friday presented F. M. Zeder, vice-president in charge of engineering, with a portrait of himself, painted by Fred C. Nash, well-known Detroit artist. The presentation took place while in the corporation's new engineering building at Highland Park. Photo shows officials at the ceremony. From left to right: H. T. Woolson, J. C. Zeder, C. Breer, Mr. Zeder, Walter P. Chrysler, Howard Maynard, O. H. Clark, Charles Davy and O. R. Skelton

Tire Production Shows Recession

Drop in All Classes Is Shown in Totals for Month

NEW YORK, Aug. 19—Production of tires of all classes decreased during June as compared with May, but was higher than in June of a year ago, according to figures compiled by the Rubber Manufacturers Association which are assumed to be representative of 90 per cent of the production of the country.

Production of all classes of casings during June was 5,477,771 as compared with 6,109,026 in May and with 5,019,472 in June of last year.

Production of inner tubes of all types was 5,233,804 as compared with 5,745,129 in May and with 5,215,088 in June of last year.

In the case of high pressure casings, June production was lower than June of last year as well as lower than May of this year. Production of high pressure tubes, however, exceeded May of this year but was higher than June of last year. Comparative figures follow:

	Inventory	Production	Shipments
PNEUMATIC CASINGS—ALL TYPES			
June 1929	13,467,567	5,477,771	5,440,693
May 1929	13,386,440	6,109,026	5,388,291
June 1928	9,121,776	5,019,472	5,338,056
INNER TUBES—ALL TYPES			
June 1929	14,055,514	5,233,804	5,212,171
May 1929	14,195,731	5,745,129	5,278,193
June 1928	12,869,659	5,215,088	5,352,393
BALLOON CASINGS			
June 1929	9,471,532	4,223,335	3,829,506
May 1929	9,047,376	4,732,416	4,022,910
June 1928	5,587,586	3,653,508	3,486,748
BALLOON INNER TUBES			
June 1929	9,654,688	4,049,173	3,510,947
May 1929	9,167,038	4,586,606	3,795,350
June 1928	7,311,204	3,553,191	3,184,056
HIGH PRESSURE CORD CASINGS			
June 1929	3,966,799	1,249,596	1,594,201
May 1929	4,285,674	1,371,987	1,356,529
June 1928	3,362,861	1,345,857	1,812,907
HIGH PRESSURE INNER TUBES			
June 1929	4,384,077	1,177,147	1,698,896
May 1929	5,017,011	1,155,013	1,480,293
June 1928	5,558,465	1,661,897	2,168,337

Triple Air Merger Formed

NEW YORK, Aug. 18—Major Reuben Fleet, president and general manager of the Consolidated Aircraft Corp. of Buffalo has announced that through stock transactions his company has acquired the Fleet Aircraft Corp. of Buffalo and the Thomas-Morse Aircraft Co. of Ithaca, N. Y., and an interest in the Kinner Airplane & Motor Corp. of Glendale, Cal.

The Consolidated also takes title to the National Flying Schools, Inc.

Duty on Packing Is Included

WASHINGTON, Aug. 22—Packing and freight charges to the port of shipment will be included in the dutiable value of automobiles subject to ad valorem duties in Peru, it has been decreed by the Peruvian government, according to a dispatch from Lima received by the Department of Commerce. The ad valorem duties on automobiles formerly were calculated only on the invoice value at the place of origin plus a surtax of 20 per cent for cost of transportation to the Peruvian warehouse, it is pointed out. These costs continue to be included in the dutiable value.

United-Carr Fastener Financing is Initiated

NEW YORK, Aug. 22—Initial financing for the newly organized United-Carr Fastener Corp., representing a consolidation of the Carr Fastener Co. and the United States Fastener Corp., has been begun by the First National Corporation of Boston and the Central Illinois Company, Inc.

They are offering an issue of $2,000,000 ten-year 6 per cent convertible debentures and 500,000 shares of capital stock. In connection with this financing, all the preferred stock of the Carr Fastener Co. is to be retired. M. F. Carr, president of the Carr company, will be chairman of the new company, and Sinclair Weeks, president of the United States Fastener Corp., will be president of the combined concern.

Auto Specialties to Expand

ST. JOSEPH, MICH., Aug. 20—An expansion program calling for the expenditure of approximately $750,000 during the next 12 months was announced by J. W. Tiscornia, president and general manager of the Auto Specialties Manufacturing Co. Construction of new buildings will give the company 85,000 sq. ft. of additional floor space and bring the amount of property under roof to 12 acres. A continuous electric melting process, mold conveyor and sand-handling equipment designed to increase efficiency and take hard labor out of the foundry will be installed.

Engineers Save on Concrete Mix

WASHINGTON, Aug. 22—Highway engineers of the Bureau of Public Roads believe a saving of about $1,000 per mile in the cost of concrete roads can be effected by increasing the proportion of broken stone or gravel in the concrete mixture from three and one-half to four and one-half parts to each part of cement and two parts of sand, it was announced this week by the Department of Agriculture. A pavement about one-half mile long, made up of slabs nine ft. sq. and seven in. thick, is now being constructed at the Arlington Experiment Station to test the new mixture.

Offers New Cab Body

CORUNNA, MICH., Aug. 20—The Weatherproof Body Corp., a division of Allied Motor Industries, Inc., has placed on the market a new line of cabs ranging from simple inclosures to de luxe models, completely lined in artificial blue leather, with genuine leather upholstery, dome light, nickel controls, windshield wiper, nickel doorpulls and fancy moldings. Prices range from $142 to $220.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries.

NEW YORK, Aug. 22—Retail trade and industrial activity have been somewhat less active during last week, but the contrary is true of many wholesale and jobbing lines. Trade in general may be said to be fair to good and continues above last year's levels. Crops are being marketed with more ease than usual. The cotton mill strike in Lancashire, England, involving 500,000 workers, has ended.

Consumption of electrical energy in industrial operations during July was 4.6 per cent below that of June but 7.3 per cent above that a year ago. The average monthly rate of consumption for the first seven months of the current year was 12.7 per cent above that for the corresponding period last year.

WHEAT

The August 1 estimate of the winter wheat crop, recently published by the United States Department of Agriculture, places production of the current crop at 568,233,000 bushels, as compared with the estimate of 582,492,000 bushels a month earlier and a harvest of 578,133,000 bushels in 1928.

EXPORTS

Merchandise exports during July amounted to $401,000,000 as against $378,984,000 during July of last year, while imports amounted to $353,000,000, as against $317,848,000 a year ago.

CAR LOADINGS

Railway freight loadings for the week ended August 3 totaled 1,104,193 cars, which marks an increase of 3,123 cars over those in the preceding week and an increase of 55,372 cars over those in the corresponding week a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended August 17 stood at 97.3, as against 97.6 the week before and 98.6 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended August 14 were 14 per cent above those in the corresponding week last year.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended August 14 showed decreases of $36,100,000 in holdings of discounted bills and of $3,300,000 in holdings of Government securities. There were increases of $38,700,000 in holdings of bills bought in the open market and of $7,500,000 in member bank reserve deposits. The reserve ratio on August 14 was 74.6 per cent, the same as that a week earlier.

Continental Forms Aircraft Engine Co.

Production of Airplane Power Plants to Start on Large Scale

NEW YORK, Aug. 19—Continental Motors Corp. has organized Continental Aircraft Engine Co. to manufacture and develop aircraft engines. The new company was organized with a Delaware charter and has a capital of 250,000 shares of no par common stock, all of which is owned by Continental Motors.

W. R. Angell, vice-president of Continental Motors Corp., is president of the new company. Robert Insley, who has been in charge of development work, is vice-president, R. M. Sloane, treasurer of Continental, is treasurer of the new company, and W. C. Keith, assistant secretary of Continental, is secretary of the new company.

These officers, together with W. A. Frederick, vice-president in charge of engineering at Continental Motors, constitute the board of directors.

In announcing the formation of the new company, Ross W. Judson, president of Continental Motors, says that Continental Aircraft Engine Co. will continue to utilize the facilities of the parent company. Production is to be carried on at the Detroit plant located near the Detroit City Airport.

Continental to Exhibit New Engine

DETROIT, Aug. 17 — Continental Motors Corp. will exhibit its Model A70 160 hp. radial engine and an interesting display of component parts at the Aeronautical Exposition to be held in Cleveland, Aug. 24 to Sept. 2, in conjunction with the National Air Races.

Continental's activities will also be extended to the Cleveland airport where the company's four-passenger monoplane, powered with its aircraft engine, will be available for demonstration purposes.

C. P. Russell, aeronautical sales manager, will be in charge of the exhibit, together with F. T. Gould. Other executives of the Continental Aeronautical Division who will attend the show during the week, include Robert Insley, chief engineer; A. M. Niven, asst. chief engineer; Louis Merrill, chief designer; O. L. Snyder, production superintendent, and R. N. DuBois, experimental engineer.

Huge Seaplane Being Assembled

PHILADELPHIA, Aug. 23—A large seaplane, said to be of 50-passenger capacity, is being assembled at the Philadelphia Navy Yard. The craft was built by the Dornier concern and shipped from Europe for assembly here.

Spanish Loans to Encourage Industry

WASHINGTON, Aug. 22—To encourage the local automobile industry, the Spanish government has agreed to grant advances during eight years not exceeding 300,000 pesetas annually toward insuring interest return at 5 per cent on capital of 10,000,000 pesetas of Industria Nacional Matalurgica, it was stated in a Madrid cable received this week at the Department of Commerce.

Members to Draw for M. E. A. Exhibit Space

NEW YORK, Aug. 19—Drawings for space in the annual business exhibit of the Motor & Equipment Association, to be held in Chicago Nov. 4 to 9, will be conducted in that city at the Hotel Stevens on Sept. 10 at 10 a. m., Chicago daylight time. Many members of Division B of the association have already applied for space and wholesale members are indicating a widespread interest in the exhibit and the convention which will be held at the same time.

General Motors to Buy Day-Fan Radio, Report

DAYTON, OHIO, Aug. 20 — The proposed merger of the Day-Fan Electric Co., of Dayton, radio manufacturers, with the General Motors Corp. was announced here tonight by Le Warren James, president of the Dayton company.

The merger is to be effected by an exchange of stock and is yet to be approved by the stockholders of the Day-Fan Company, Mr. James said. He added that the Dayton company had accepted a proposal made by General Motors.

Lindbergh Tries Diesel

DETROIT, Aug. 17—Colonel Charles A. Lindbergh and Major Thomas G. Lanphier, both officials of the Transcontinental Air Transport, Inc., were invited by Alvan Macauley, president of the Packard Motor Car Co., to fly on test a new Diesel airplane motor designed by Captain L. M. Woolson of the company. The fliers visited the new factory built by the company for the production of the motors. A fuel test made by the Colonel and Mr. Macauley showed the non-inflammable qualities of the fuel as compared with gasoline.

The Colonel drove an automobile around a concrete track at Utica, before the flight, attaining a clocked speed of 112 miles an hour. He demonstrated the same skill and daring at the wheel that he has shown at the controls of airplanes.

Autosales Corp. Installs Kiosks

NEW YORK, Aug. 17—The Autosales Corp. has completed the installation of the first of its new vending kiosks in four Standard Oil of New Jersey filling stations in Philadelphia, Newark and East Orange as initial steps in the installation of a chain of automatic vending shops in gasoline filling stations. Installations now are being made in Baltimore and Washington.

Goodrich Approves Merger With Hood

Purchase by Exchange of Stocks Voted by Directors

NEW YORK, Aug. 20—The directors of the B. F. Goodrich Co. yesterday approved a plan for acquisition of the Hood Rubber Co. through an exchange of stocks of the companies on the basis of two shares of Hood for one share of Goodrich.

A subsidiary of the Goodrich company is to assume the Hood company's debts and to retire its preferred and special stocks and those of the Hood Rubber Products Co. on their respective redemption days at the redemption prices.

It is estimated that it will take about 100,000 shares of Goodrich stock to accomplish the exchange. Goodrich has 1,500,000 shares authorized and 953,638 outstanding.

Stockholders of the Hood company, whose directors have approved the plan, will have the proposition submitted to them on Aug. 30.

The Hood Rubber Company was incorporated in 1896, and has a plant at Watertown, Mass., with ninety-six acres of land and buildings with 2,048,510 sq. ft. of floor space. Its main products are rubber footwear, rubber heels and soles, automobile tubes and tires, rubber tilings and rubber molded goods.

The Hood Rubber Co. owns all the common stock of the Hood Rubber Products Co., which distributes the Hood products. This company was incorporated in 1919, as a consolidation of the following subsidiaries of the Hood Rubber Co.: Hood Tire Co., Inc., Watertown; Pilgrim Rubber Footwear Co., Boston; Pioneer Rubber Shoe Co., Minneapolis; Dearborn Rubber Co., Chicago; Iowa Rubber Shoe Company, Davenport, Iowa; Southwest Rubber Footwear Co., Kansas City, Mo.; Capital City Rubber Co., Columbus, Ohio, and Grand Rapids Shoe and Rubber Co., Grand Rapids, Mich. It maintains branches and warehouses in forty cities of the United States. It has outstanding $5,000,000 of common stock, all of which is held by the Hood Rubber Co., and $1,000,000 of 7 per cent cumulative preferred stock.

The company reported a net loss of $1,473,104 for 1928, explained as being due, in part, to breaks in the price of crude rubber. Goodrich common stock closed at 75⅞ yesterday on the Stock Exchange.

Pioneer Will Equip Consolidated

NEW YORK, Aug. 20—Pioneer Instrument Co., subsidiary of Bendix Aviation Corp., has signed contracts for placing Pioneer navigation and flight equipment on planes manufactured by Consolidated Aircraft Corp. of Buffalo and New Standard Aircraft Corp. of Paterson, N. J.

Men of the Industry and What They Are Doing

Auburn Names Three to Body Engineering Staff

R. I. Schonitzer, formerly chief engineer with the Hydraulic Steel Co., of Cleveland, and also formerly with the C. R. Wilson Body Co., of Detroit, becomes body engineer with the Auburn Automobile Co.

William Taylor has joined Auburn's engineering staff on special work. He was body engineer with the Edward Budd Co. for the last 17 years and was in charge of the model body department.

C. A. Sampson has been named chief body inspector at the Auburn plant. Previous to his joining Auburn, he was chief body inspector for the Fisher Body Co., Detroit, for the last 11 years.

Young Appointed Aviation Head

Clarence M. Young, of Des Moines, was appointed Wednesday by President Hoover as Assistant Secretary of Commerce for Aviation. He succeeds William P. MacCracken, resigned. He has been director of the Bureau of Civil Aeronautics of the department. Mr. MacCracken expects to return to the practice of law about Oct. 1.

Hemphill Assigned to Europe

Claude L. Hemphill, vice-president of the Commercial Investment Trust Corp., who has been president and active head of the Chicago subsidiary, is to remain in Europe, where he will become resident vice-president in charge of European operations with headquarters at Paris. Mr. Hemphill has been with the organization sinces its inception 21 years ago.

Nettleton is Peerless Sales Head

Ralph B. Nettleton, a Clevelander of wide experience in the automobile distribution field, has been appointed sales manager of the Peerless Motor Car Corp. He has been with the Locomobile, Lozier, Chandler and Paige organizations. Much of his previous business experience has been in Boston, where he has been a distributor.

Gray to Head Mercer Sales

C. W. Gray, formerly engaged in sales work with Durant Motors and previously to that associated with various units of General Motors, has been given charge of the organization and supervision of sales and dealer development of the new company recently organized to build the Mercer car in 1930.

Calhoun Resigns From Triplex

T. A. Calhoun, for some time general sales manager of the Triplex Safety Glass Co. of North America, has resigned. Mr. Calhoun has been connected with the Triplex company since its organization in 1926.

Colonel L. S. Horner

who has been appointed by Secretary of Commerce Lamont as chairman of the Advisory Committee on the Census of Manufacture. He is president of the Niles-Bement-Pond Co., New York, and is a director of the Chamber of Commerce of the United States

Budd Elects Officers

Donald Alexander and William J. Meine have been elected vice-presidents, H. A. Coward was named secretary, and C. W. Messinger was appointed assistant treasurer of the Edward G. Budd Mfg. Co., Philadelphia.

Mr. Alexander also was elected vice-president of the Budd Wheel Co., Mr. Coward, secretary, and Mr. Messinger, treasurer.

Eckman is Manager

M. L. Eckman has been appointed general manager of the Taylor-Winfield Corp., Warren, O. He has been a supervisor for the Ford Motor Co. for the past 10 years.

Anderson With Cooper-Bessemer

James H. Anderson, formerly with the United Engineering & Foundry Co., has been appointed works manager of the Cooper-Bessemer Corp.'s Grove City (Pa.) plant.

Budd Sails for Europe

Edward G. Budd, president of the Edward G. Budd Mfg. Co., left Aug. 23 to visit Budd interests in England, France and Germany, sailing from New York on the S.S. Majestic, according to an announcement made earlier in the week. This will be the second time this year that Mr. Budd has visited Europe.

Navy Expert Resigns to be Bendix Research Head

Lieut. Commander Clinton Havill, chief of the propeller section of the Navy Bureau of Aeronautics, who in 1928 won the Wright Brothers' medal for meritorious contributions to aeronautical engineering awarded by the Society of Automotive Engineers, resigned from the service recently to become director of research for the Bendix Aero Corp. of East Orange, N. J.

He was the first recipient of the medal, winning it for a paper on "Aircraft Propellers." The medal having been offered since 1924 was not conferred until last year because no papers received had met the high standards.

Lieut. Commander Havill was born in Rochester, N. Y., in 1892, and was graduated from the Naval Academy in 1916, later taking post-graduate work in aeronautical engineering at the Massachusetts Institute of Technology.

Oakland Sales Promotions

W. B. Sawyer, formerly eastern sales manager for Oakland, and W. E. Fellows, formerly advertising manager of the company, have been named assistant general sales managers of the Oakland Motor Car Co. Hugh Higginbottom, formerly assistant to W. R. Tracy, vice-president in charge of sales, assumes Mr. Sawyer's position as eastern sales manager, and H. E. Mahaffey, former Chicago regional manager, becomes western sales manager. Grady Gamble, former Dallas zone manager, takes Mr. Mahaffey's place and C. L. Voss, former Chicago zone manager, becomes Dallas zone manager, and is succeeded at Chicago by E. M. Lubeck. C. S. McElwain, former assistant advertising manager, has been named acting advertising manager.

Campbell is Recovering

Colin Campbell, vice-president in charge of sales of the Willys-Overland Co., who suffered an embolism of the brain while returning to Detroit from Buffalo aboard a lake steamship last Sunday, was reported as improving rapidly at the Ford Hospital in Detroit. He had been visiting several eastern distributors of the company and was returning to his home here by way of Detroit.

Fisher's Yacht is Launched

With simple ceremonies the motor yacht Nakado, built at the plant of the Pusey & Jones Corp. for Fred T. Fisher, of Detroit, was launched Tuesday afternoon at Wilmington, Del. Mrs. Fisher was the sponsor for the craft. The boat will cost $1,000,000 and is one of the largest motor yachts afloat. It is 236 feet long.

Steel Rallies As Strip Price Gains

Semi-Finished Sells at $35 on Several New Order Contracts

NEW YORK, Aug. 22—A somewhat stronger undertone is noted in the market for strip steel as the result of the price for semi-finished material being firmly established on a $35 basis. For some time non-integrated rollers had contended for continuance of the second-quarter price of $34 on billets and slabs, but within the last few days a representative number of contracts have been signed at $35.

Manufacturers of full-finished automobile sheets continue to receive sufficient business to enable them to maintain operations at a good rate, although backlogs are no longer as heavy as they were a few weeks ago. Here and there one hears of slight concessions on black sheets, but while the market is a trifle irregular, it could hardly be called soft, a mill after having shaded the price to get a certain order frequently declining to duplicate this concession when it comes to the general run of business.

Prices for bolts and nuts are unchanged, automotive demand being of a routine character.

Pig Iron—In some distributing markets business is merely light and in others positively dull. A little filling-in by automotive foundries is noted, but interest in fourth quarter contracts is in abeyance. Market prices are nominally unchanged.

Aluminum—Demand is light for the time being. Prices are entirely unchanged for both virgin and secondary metal.

Copper—Heavier shipments are being made by refineries to fabricating departments.

Lead—The market is quiet. Storage battery manufacturers have the bulk of their September requirements covered on an average contract basis. The price remains unchanged at 6.75c, New York.

Zinc—Fairly steady and unchanged.

U. S. Rubber to Move Soon

DETROIT, Aug. 22—Concentration at Detroit of all tire activities of the United States Rubber Co. will be effected in the next few weeks, according to F. B. Davis, chairman and president. This would involve removal of all executive sales and office staff of the tire department of the company to this city from the present general offices in New York City. There will also be a greater centralization of tire manufacturing in Detroit, including transfer to this city of manufacturing operations now being carried on in Hartford, Conn.

All-Metal Dirigible Tested

GROSSE ISLE AIRPORT, DETROIT, Aug. 20—The all-metal dirigible ZMC-2, carrying four persons, rose lightly from the broad flying field outside its hangar here tonight and cruised back and forth over the countryside for two hours.

Financial Notes

City Machine & Tool Co., Toledo, reported net earnings of $352,475 after depreciation and Federal taxes, for the six months ending June 30, equivalent to $2.35 a share on common stock outstanding and shows a gain of $65,000 over the same period a year ago. Changes in models by many leading car makers have made a prosperous business for this company, it is reported. Third quarter is looked to be better than preceding periods this year.

Stewart-Warner reports net profit for the first six months of the current year of $4,528,372 after all charges. This is equivalent to $3.71 a share on capital stock and compares with $3,613,334 for the corresponding period a year ago, or $6.03 a share on capital stock then outstanding. Net profit for the June quarter is $2,474,148, or $2.02 a share, as against $2,226,050 for the corresponding quarter a year ago.

Miller Rubber Co. reports net loss for the first quarter of the current year of $664,163 as compared with $3,121,860 for the corresponding period of last year.

Raybestos-Manhattan Co., Inc., reports net income for the first half of 1929 after all charges of $2,098,530. This is equivalent to $3.10 a share on outstanding stock. Net income from the three companies now comprising Raybestos-Manhattan was $1,286,000, or the equivalent of $1.90 a share, on the basis of present capitalization.

Johns-Manville Corp. has declared regular quarterly dividend of 75 cents a share on common payable October 15 to stockholders of record Sept. 24 and $1.75 on preferred payable Oct. 1 to stockholders of record Sept. 10.

Motor Wheel Corp. of Lansing, Mich., has indicated the possibility of increasing its cash dividend rate. The present rate has been maintained at 50 cents per share each quarter or $2 per year. A letter signed by Harry Harper, president, and mailed to stockholders Aug. 15, says: "It is evident that a more liberal cash dividend can be maintained in the future." The earnings of the company for the first six months of this year, as recently announced, were $3.54 a share on 687,000 shares of no par stock. Even on a basis of 825,000 shares which will be outstanding following the October stock dividend, earnings for the first six months are approximately $3 per share.

Jordan Motor Car Co. reports for the seven months ended on July 31 a net income of $165,168, equal after preferred dividend requirements to 28 cents a share on 450,000 common shares outstanding, against a net loss of $510,723 in the corresponding period last year.

Raybestos-Manhattan Co., Inc., reports for the first half of 1929 a net income of $2,098,530 after charges, equal to $3.10 on 676,012 shares. The six months' net income of the three companies which now constitute the merged company were approximately $1,286,000 in the same period last year, equal to $1.90 a share on the present basis of capitalization.

Airstocks, Inc., reports a net profit of $530,849 before taxes, equivalent to $5.30 a share on the outstanding capital stock for the period from Jan. 15 to July 29.

Campbell, Wyant & Cannon Foundry Co. reports for the half year ended June 30 net earnings of $1,061,828 after charges and Federal taxes, equal to $3.05 earned on 348,000 no par capital shares outstanding as against $901,010, or $4.29 on 209,898 shares outstanding the corresponding period of 1928. Earnings for the 1929 period reflect the acquisition of the National Motor Castings Co., which is also reflected in the increase in outstanding stock.

Murray Corp. of America and subsidiaries report earnings for the six months ended June 30 of $1,632,676 after all charges. This is equivalent after preferred dividends to $3.02 a share on common stock and compares with $643,491, or $2.35 a share, on stock outstanding as of June 30, 1928.

Gyro Inventor Arrives

NEW YORK, Aug. 20—Juan de la Cierva, inventor of the autogyro, arrived here this morning on the S.S. Majestic. He plans to attend the joint Society of Automotive Engineers and Aeronautical Chamber of Commerce meeting to be held in Cleveland next week, and will also spend some time in Philadelphia with the Pitcairn Aviation Corp. with which he has a contract covering manufacturing in this country.

Eastern Aircraft is Financing

NEW YORK, Aug. 20—Eastern Aircraft Corp., Pawtucket, R. I., American licensee for Messerschmitt types of airplanes of Bayerische Flugzeugwerke, A.G., of Augsburg, Germany, is floating an issue of 70,000 shares of stock at $12.50 a share. Proceeds of this flotation will be used to provide the corporation with additional facilities to meet the demand for planes of small all-metal type.

E. E. Warfield

NEW YORK, Aug. 22—E. E. "Dave" Warfield, director of merchandising for the Raybestos-Manhattan Co., and formerly sales manager of the Manhattan Rubber Co., died Aug. 19 after a week's illness.

Sale of Sikorsky is Assured

NEW YORK, Aug. 20—Deposit of stock of Sikorsky Aviation Corp. under the terms of the acquistion of that company by the United Aircraft & Transport Corp. have been sufficient to assure the completion of the deal.

Air Mail Gets Lowest Bid

WASHINGTON, Aug. 22—The lowest bid ever offered on an air mail route was submitted by the Varney Air Lines, Inc., of San Francisco, when bids were opened here this week by the Post Office Department for the route from Salt Lake City to Pasco, Wash. The Varney company offered to carry mail by air over the route for nine cents per pound.

Important Changes Made in Ford Cars

Improvements on Model A Engines to Increase Efficiency

DETROIT, Aug. 21—Important changes and improvements which have recently been made in the Model A Ford include: shorter valve guide bushings, new design breather pipe and the rear wall of the cylinder block has been reinforced.

In the former design, the valve guide bushings were 2⅜ in. long with a tapered end. The new guide is 2⅛ in. long and the lower end is finished with a curve. The reason for the change is to reduce the possibilities of sticking valves.

The new breather pipe prevents oil being blown out of the crankcase by directing the flow of oil toward the center of the pipe. This is attained by having the baffles point upward instead of down.

The thickness of the rear wall of the upper half of the crankcase has been increased by 3/32 in., and the wall reinforced by adding 5/16 in. to the height of the rib adjacent to the oil lead on the inner side of the rear wall. An additional rib ⅜ in. high by ⅜ in. wide has also been placed in the center of the inner face of the rear wall. These extra reinforcements are designed to give a quieter running motor, better foundation for the crankshaft rear bearing and lessen the possibility of noise developing at that point.

A stronger engine front support spring is now being used on the AA trucks. It is announced that this stronger spring will also be used on the passenger cars in the near future. The width of the piston pin retainer has been decreased from .120 in. to .115 in. with a corresponding decrease in the retainer groove. The new retainers cannot be used in the old rods, nor the new rods with the old retainers. This change was made to add to the quietness of the engine.

Sees Progress in China

NEW YORK, Aug. 20—Mark L. Moody, Packard distributor for China, Manchuria, Mongolia and Siberia, has returned to this country for the first time in 10 years. Mr. Moody covers his territory twice a year and is confident that highways, which are beginning to receive the official attention of the Nationalist Government in China, will open up that country to progress through the medium of the motor car.

Salesmen to Attend Packard Session

NEW YORK, Aug. 20—The Packard Motor Car Co. of New York will send 46 of its salesmen to Detroit to attend the four-day master salesmen's convention at the factory there. This is the climax of the nation-wide sales competition in which the New York company placed 46 out of a total of 125 selected for the entire country.

Graham-Paige Sets Up New Sales Areas

DETROIT, Aug. 23—The Graham-Paige Motors Co. has divided its domestic sales territory into separate divisions, each one under a newly appointed divisional sales manager working under F. R. Valpey, general sales manager.

The divisional sales managers are as follows: Western division, W. R. Heilman, formerly assistant general sales manager; Eastern division, H. T. Parrett, formerly district manager at Chicago; Eastern division, W. C. Fage, formerly district manager of Philadelphia and Southern division, R. W. Baskett, formerly manager of districts.

The creation of separate divisions was deemed advantageous to permit closer cooperation by the factory with the rapidly increasing dealer and distributor organization handling Graham-Paige in the United States.

The divisional sales managers will have their headquarters at Detroit but will spend much of the time in their territories.

Italians Acquire Rights to Use Hamilton Design

MILWAUKEE, Aug. 22—Rights to use the Hamilton all-metal monoplane design in building aircraft in Italy have been acquired from the Hamilton Metalplane Co., of Milwaukee, by the Trans-Asiatica Co. of Rome, it is announced. The Italian company now uses a Hamilton ship in passenger service over the Alps and is desirous of adding a fleet of this type of cabin ship. A member of the Hamilton staff may go to Italy or the Trans-Asiatica may send its experts to Milwaukee to get the new planes into production.

More Cotton is Used in Tires

WASHINGTON, Aug. 22—Approximately 700,000 bales of cotton were consumed by manufacturers of rubber tires in 1928 as compared with 250,000 bales in 1921, an increase of 182 per cent, according to a study of the use of cotton in the rubber tire industry which has just been completed by the Textile Division of the Department of Commerce. The tire and tube industry used about 10 per cent of the total production of cotton goods by weight, it was stated. Although the greatest portion of this quantity was used in cord fabric and fillerless cord fabric, square woven fabrics, sheetings, flannel, osnaburgs, enameling duck and lenos were also used.

Plan Goodrich-Richfield Building

SPOKANE, WASH., Aug. 19—A $300,000 building will be erected here for the Pacific Goodrich Rubber Co. and the Richfield Oil Co. of California.

Advertisers Agree Barriers Must Fall

Mooney Finds Delegates to Berlin Session in Accord

NEW YORK, Aug. 20—False economic barriers of every kind now existing between various nations must be removed. This was the opinion reached by advertising men attending the International Advertising Association Convention in Berlin, according to J. D. Mooney, president of General Motors Export Co. and vice-president of General Motors Corp., who returned to New York today aboard the S. S. Bremen from Europe where he was attending the convention.

The convention did much to convince advertising men that it is time for governments to reverse the trend "of building Chinese walls around themselves in the form of embargoes and high tariffs," according to Mr. Mooney.

While these men did not question the right of nations to defend themselves or their industries, they believe that various nations can get together on a common ground to their immediate advantage and raise the standards of living throughout the world.

In commenting on General Motors business overseas, Mr. Mooney said that business is good and that his company's volume should run over $325,000,000. The outlook, especially in the truck and bus field, is good for an even larger volume.

Domestic Electric Buys Buildings in Suburbs

CLEVELAND, Aug. 20—The Domestic Electric Co., of this city, has purchased a group of buildings and a tract of land at Kent, Ohio, to be devoted solely to the manufacture of fractional horsepower motors of the universal type, for all types of motor-driven devices. The buildings will more than double the capacity of the present plant in Cleveland, according to Carl A. Duffner, president.

The Domestic Electric Co. is a division of Black & Decker, Towson, Md. Other companies in this group are the Van Dorn Electric Tool Co., Cleveland; Black & Decker Mfg. Co., Ltd., Canada; Black & Decker, Ltd., England, and Marschke Mfg. Co., Indianapolis.

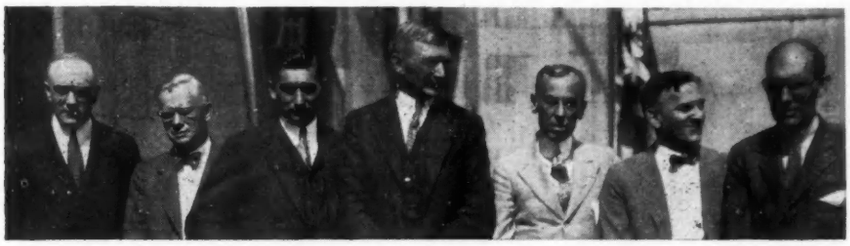
Budd Wheel Closes Contract

NEW YORK, Aug. 22—The Budd Wheel Co. has closed a contract with a large Mid-Western truck company to supply its 1930 requirements on Budd dual steel disk wheels, according to an announcement made here by Edward G. Budd, president. This contract will total about $250,000.

U. S. Leads in Ceylon Registrations

WASHINGTON, Aug. 22—Sixty-six per cent of the 17,311 automobiles, or 11,420, registered in Ceylon on Jan. 1, 1929, were of American Manufacture.

General Motors Executives Attend Convention



Among prominent officials who attended the Chevrolet National Sales Convention at Detroit last week, in celebration of the sale of the millionth Chevrolet six since Jan. 1, were, left to right: C. M. Coyle, vice-president and auditor of Chevrolet; C. F. Barth, vice-president in charge of Chevrolet production; H. J. Klingler, vice-president and general sales manager; W. S. Knudsen, president of Chevrolet; A. P. Sloan, Jr., president, General Motors Corp.; John L. Pratt, vice-president of General Motors, and C. F. Kettering, general director of General Motors Research

In Mr. Klingler's address to the sales representatives he said in part: "Chevrolet never fell short of achieving a sales quota in its history. We built our millionth six-cylinder car Aug. 5. Every day since then our nine assembly plants have been producing cars at the average rate of 6500 a day. By Jan. 1, adding the remaining portion of August to our last four months' quota, we will have sold more than 1,350,000 automobiles"

City Auto Stamping Co. May Increase Stock

TOLEDO, Aug. 19—The City Auto Stamping Co., in which C. O. Miniger and associates are heavily interested, and which is scheduled to open its new plant here the first week in September, has called a meeting of stockholders to be held here Tuesday, Aug. 27, to consider increase in stock from 150,000 to 225,000 shares which will permit raising $1,125,000 of new capital for another 60 per cent enlargement of the plant. The deal is based upon the closing of a contract for nearly $5,000,000 of work for a large automobile company, identity of which has not been disclosed. This big contract will keep the present plant going at capacity. The plant will employ 300 men on each shift to begin and later increase its working force.

Biflex Expands Facilities

DECATUR, ILL., Aug. 14—The Biflex Products Co. has let a contract for a $50,000 forging plant to take care of expanding business. The structure will be 150 by 160 ft. Automatic machines for molding bumpers will be used and all obsolete machinery will be replaced with new. The company has closed the original plant in Waukegan.

Erie Meter Buys Truck Plant

ERIE, PA., Aug. 14—The Erie Meter Systems, Inc., manufacturer of gasoline measuring pumps for filling stations, has acquired the former plant of the Consolidated Motor Truck Co., and plans to equip it with the latest machinery for capacity production.

Pick to Build New Factory

WEST BEND, WIS., Aug. 14—The Pick Mfg. Co., manufacturer of automobile replacement parts, has purchased eight acres for the erection of a new factory building. Work on the new plant, which will measure 50 x 300 ft., has started and it is expected to be completed by October 1.

Budd Body Gets Large Order for Steel Bodies

PHILADELPHIA, Aug. 16 — The Edward G. Budd Mfg. Co. of this city and Detroit has been awarded a contract for Budd all-steel automobile bodies involving between $30,000,000 and $35,000,000, it was announced following a meeting of the Board of Directors yesterday. It is one of the largest body orders ever placed in the history of the automobile industry.

No announcement was made as to the automobile manufacturer placing the order. In the past the company has done considerable work in body building for Ford, Dodge and other large automobile manufacturers.

E. R. Tunison

PHILADELPHIA, Aug. 22 — Burial of Burnell R. Tunison, vice-president of American Solvents & Chemical Corp., who died following an operation for acute appendicitis was in California. Mr. Tunison was born in San Francisco, on Dec. 13, 1892, and was graduated from the University of Southern California in 1916 in chemical engineering. He engaged in research work in the field of petroleum refining and in 1926 joined American Solvents and Chemical Corp.

Young Spring Earns $3 Per Year

DETROIT, Aug. 22—The common stock of the L. A. Young Spring & Wire Co. has been placed on a $3 annual basis through the declaration today of a quarterly dividend of 75 cents, payable Oct. 1, to stock of record Sept. 13. Previously dividends of 50 cents quarterly and extras of 25 cents had been paid.

Will Corp. Purchases Old Star Car Plant

OAKLAND, CAL., Aug. 22—The C. H. Will Corp., manufacturers of buses and trucks, whose main factory is at Minneapolis, will establish its Pacific Coast plant in this city. This was announced here by Norman De Vaux, president and general manager of the Durant Motor Co. of California.

At the same time it was disclosed that the Will Corp. has purchased the site and buildings used formerly by the Star car distributing organization on the Pacific Coast. The price was not revealed, but it was said to be well over $500,000.

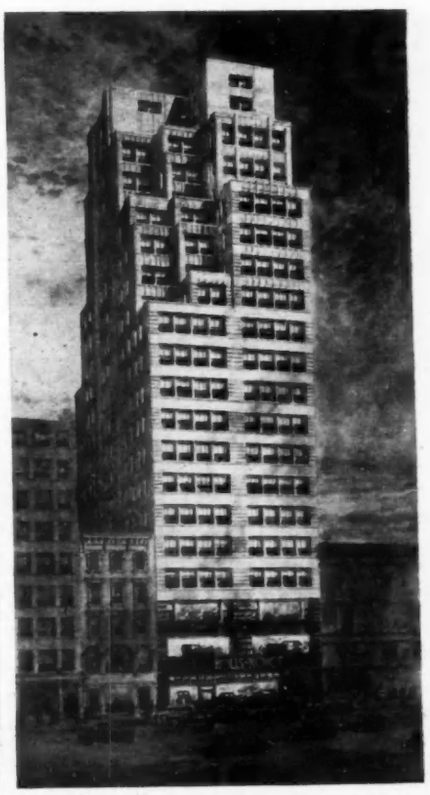
The property adjoins that of the Durant Co., with which the Star Co. was merged some time ago and has been unused since that time.

The Will Corp., it was stated, will manufacture buses and trucks on a large scale for distribution throughout the Western States.

Aviation Corp. Is On Exchange

NEW YORK, Aug. 19—The Aviation Corp. has been listed on the New York Stock Exchange for trading. This corporation has recently acquired the ownership of Wein Alaska Airways and Bennett Rodebaugh Airplane Co. These two companies are owned by Alaska Airways, Inc., subsidiary of The Aviation Corp.

Rolls-Royce Building



The new 20-story Rolls-Royce building at 32-34 East 57th Street, New York City, into which Rolls-Royce of America, Inc., will move its New York headquarters January 1.

Turkish Commission to Visit Factories

Delegation Will Fly to Coast on Trip of Inspection

NEW YORK, Aug. 19—The Turkish Aircraft Commission, which arrived in New York last week to begin its nation-wide tour to study aviation in this country, has outlined a comprehensive program for its six weeks' visit. Most of the traveling will be done by airplane.

The commission is headed by Major Shefik Bey, chief of the Turkish General Staff for Aviation. The other members are Capt. Ferruh Bey, a well-known pilot, who received much of his training in France; First Lieutenant Kiazim Bey of the Turkish Naval Aviation Forces, who has been residing in England for the past two years, and Ahmed Bey and Moulis Bey, representing commercial aviation interests in Turkey.

The program of activities as at present outlined follows.

Aug. 13—Fly to Washington, entertainment in the evening by the Turkish ambassador.

Aug. 14—Inspect Bolling Field and Anacostic Naval Air Station; meet officers of U. S. government aeronautical departments in Washington.

Aug. 15—Fly to inspect Langley Field, National Advisory Council of Aeronautics, Fort Monroe and Hampton Roads.

Aug. 17—Return to New York by plane, stopping at Philadelphia to inspect the naval aircraft factory.

Aug. 19 — Inspect Curtiss Aeroplane & Motor Co. plant at Garden City. Ireland Aircraft Co. dinner at Long Island Aviation Country Club in Hicksville.

Aug. 20—Inspect the army air station at Mitchel Field; fly in Curtiss Flying Service Sikorsky from Mitchel Field to Teterboro Airport, Hasbrouck Heights, N. J., to visit the plant of the Wright Aeronautical Corp. at Paterson, N. J.

Aug. 22—Leave New York for Buffalo to inspect plant of Curtiss Aeroplane & Motor Co. and be entertained until Aug. 24.

Aug. 25 and 26—At Cleveland, National air races and aeronautical exhibition.

Aug. 27—Leave Cleveland for Detroit in the morning. Inspect Ford Motor Co. plant.

Aug. 28—Fly to Selfridge Field to inspect army base there. Return to Detroit.

Aug. 29—Leave for Columbus. Inspect Port Columbus Field (Trans-continental Air Transport); fly to Dayton.

Aug. 30—At Dayton, inspect Wright field.

Sept. 1, 2 and 3—At St. Louis, inspect aircraft factories.

Sept. 5—Inspect airplane factories and fields in Wichita.

Sept. 8 and 9—At San Antonio.

Sept. 10—Fly from San Antonio to Clovis; spend night at Clovis and take Transcontinental Air Transport plane next morning to Los Angeles.

Sept. 12—At Los Angeles.

Sept. 14—Inspect Rockwell Field and naval air station at San Diego.

Sept. 16—Leave Los Angeles via Transcontinental Air Transport for New York.

Sept. 18—Arrive in New York.

New Mexican Highways Are Stimulating Automobile Industry; Club is Formed

AUSTIN, TEX., Aug. 22—According to American tourists returning through here from Mexico, the automobile industry in the Republic of Mexico is now being greatly stimulated by the improvement of the highways of the country. The policy of the government of Mexico seems to be to relieve the unemployment situation as far as possible by the rapid building of important highways and especially those connecting with this country.

The road only recently completed from Laredo, Texas, to Monterrey, Mexico, is a delight to American tourists, and this highway is being extended with all the speed possible into Mexico City. A project is also being planned to build a highway from Monterrey to Juarez by way of Torreon and Chihuahua City.

The result of all this road-building activity is especially noticeable at Monterrey, but is seen in the increasing automobile trade in Mexico City and other cities of the Republic, according to the observation of American tourists.

The Mexican-American Automobile Association, with headquarters at Monterrey, is operated on the same principles as the American Automobile Association, with an added international aspect and a provision by which American tourists entering the Republic of Mexico may have their automobiles bonded at a rate of approximately $5 each.

President E. Portes Gil of Mexico, whose personal interest in permanent road construction is responsible largely for the present road building activities, and other national officers are honorary members of the association. To show its close relationship and friendly interest in this country, Governor Dan Moody of Texas has also been made an honorary member of this international association.

Willys Earns $1.20 Per Share for First Half

TOLEDO, Aug. 19—Net income of $4,155,478 after all charges including depreciation, interest and Federal taxes, or equal to $1.20 a share on common outstanding, was earned by Willys-Overland Co., in the first half of 1929. This compared with $5,641,517, or $2.01 a share, for the same period last year.

Earnings for the first quarter of the year were $1,784,657, or 50 cents a share, compared with $2,470,821, or 70 cents a share, for the second quarter.

Price adjustments, economies of operation, and change in models gave the company a much better showing in the second quarter and company officials look for some betterment in the latter part of the year.

Emphasis in sales is being put on higher priced Willys-Knight models.

Rohr is Promoted

DETROIT, Aug. 22 — E. V. Rohr has been appointed assistant to John E. Eckenrode, vice-president in charge of sales of the Grand Rapids Metal Craft Corp., manufacturer of molding, trim panels, vanity and smoking sets. His offices are in the General Motors Bldg., Detroit.

Hudson Earns $1.25 a Share

DETROIT, Aug. 22—Directors of the Hudson Motor Car Co. today declared the quarterly dividend of $1.25 a share, payable Oct. 1, to stockholders of Sept. 11.

Marathon Now In Akron

AKRON, OHIO, Aug. 20—Goodyear Tire & Rubber Co. has transferred manufacture of Marathon tires from the Marathon Tire & Rubber Co., Cuyahoga Falls, near Akron, to the Akron plant. Lower production costs will ensue, according to P. W. Litchfield, president. Marathon has a capacity of approximately 1250 tires a day.

Stewart-Warner Holds Earnings to 1928 Level

CHICAGO, Aug. 20—The Stewart-Warner Corp. closed the first half of the year in a strong financial condition, according to the financial statement which shows the same earnings for the period as were reported in the preliminary statement. The net working capital of the company at the end of June was slightly less than at the end of the March quarter, amounting to $13,230,924 as against $14,049,174.

Current assets aggregated $16,658,589 and current liabilities $3,427,665 as compared with $17,423,897 and $3,374,723 respectively three months previously. The principal changes include a reduction in its holdings of government securities from $4,578,887 to $2,539,097 and a gain in inventories from $5,981,447 to $7,071,017. Cash account totaled $1,937,295 as against $1,859,666 in the March quarter.

Eastern Aircraft Elects Board

NEW YORK, Aug. 19—The directorate of the newly formed Eastern Aircraft Corp., which will introduce to this country the all-metal Messerschmitt types of airplanes, includes Willy Messerschmitt, of the Bavarian Aircraft Corpation, Mr. Van Arsdale, R. W. Reid, Zenas Crocker, Jr., John A. Gamons, Dr. Karl G. Frank, Frank Ludwig Habbel, Abbott Phillips and L. J. Leebrun.

I.H.C. Opens in Utica

UTICA, Aug. 20—The International Harvester Co., opened its new service station and truck salesrooms at 119 N. Genesee St., this city, recently. The factory branch will serve a territory in Utica and surrounding towns.

General Motors Sales Show Increase Over Year Ago; Less Than June, 1929

NEW YORK, Aug. 21—Dealers in cars of the General Motors Corp. delivered 181,851 automobiles to customers in July, according to an announcement made yesterday by Alfred P. Sloan, Jr., president of the corporation. This compares with 177,728 cars in the same month last year.

Sales by the manufacturing division of the corporation to dealers totaled 189,428 cars, an average daily output of 7900 cars, compared with 169,473 for July of last year.

The following table shows monthly sales by dealers to consumers in the past three years:

	1929	1928	1927
January	104,488	107,278	81,010
February	138,570	132,029	102,025
March	205,118	183,706	146,275
April	223,303	209,367	180,106
May	214,870	224,094	171,364
June	194,705	206,259	159,701
July	181,851	177,728	134,749

These figures include passenger cars and trucks sold in the United States, Canada and overseas by the Chevrolet, Pontiac, Oldsmobile, Marquette, Oakland, Viking, Buick, LaSalle and Cadillac divisions.

Sales to overseas dealers during the June quarter this year amounted to 93,979 automobiles, against 80,533 in the same period last year. For the six months ended on June 30, sales were 148,191 automobiles, as compared with 137,470 in the corresponding six months of 1928, an increase of 7.8 per cent.

These figures represent the sales to dealers by General Motors export organizations of Chevrolet, Pontiac, Oldsmobile, Marquette, Oakland, Viking, Buick, LaSalle and Cadillac in all countries, except the United States and Canada. They do not include sales of Vauxhall Motors, Ltd., or overseas sales of the products of Yellow Truck & Coach Manufacturing Co.

The following tabulation shows the number of automobiles and trucks sold to overseas dealers in the last two and one-half years:

	1929	1928	1927
First quarter	54,212	56,437	39,443
Second quarter	93,979	80,533	53,009
Third quarter	....	72,820	48,885
Fourth quarter	....	71,867	52,493

Ex-Cell-O to Increase Capacity of Factory

DETROIT, Aug. 17—The Ex-Cell-O Aircraft & Tool Corp. has completed plans to begin construction of two new plant units adjoining its present building here Aug. 19. The new buildings will increase manufacturing space by 175 per cent. One will be 440 x 120 ft. while the other will be 60 x 170 ft. The present building was completed only last September and doubled the capacity at the time. In April a new addition furnished another 65 per cent increase in space.

The company plans to devote a considerable part of the new units to the manufacture of several new precision aircraft engine parts and it is expected that operations will be started not later than Nov. 1 in the new structures. More than 60 per cent of the total business of the corporation is with manufacturers of airplanes and airplane engines. The company also makes parts for Diesel engines as well as a line of high precision tools. The stock is listed on the Detroit Stock Exchange.

Stewart Motors to Build

BUFFALO, Aug. 14—The Stewart Motor Car Corp. has filed plans with the city building department for the erection of a large storage addition to its local plant to replace that recently destroyed by fire. Preliminary work has already been started on the building, pending approval of the plans.

Toledo Employment Drops

TOLEDO, Aug. 19—Employment in Toledo continued to drop this week. There were 31,140 workers on payrolls in 51 plants which report weekly—most of them making automotive products—as compared with 33,428 a year ago. Net decline for the week was 794 workers.

U. S. Leads in Air Protection

NEW YORK, Aug. 20—The United States is doing more to protect the flying public than any other country in the world, William P. MacCracken, Jr., assistant secretary of commerce for aeronautics, told the radio audience recently in speaking in the Roads of the Sky series sponsored by the Aeronautical Chamber of Commerce and the National Broadcasting Co. He described some of the requirements for a Department of Commerce license for planes used in interstate commerce and described also the necessity for licensing pilots to operate these planes.

Huge Airplane Makes Trip

NEW YORK, Aug. 19—Information has been received here that a 1100-mile trip with passengers has been made successfully by the Rohrbach Rostra, the huge multi-motored flying boat built by Dr. Rohrbach for transatlantic service between Germany and South America.

Rummel is Building at Galion

GALION, OHIO, Aug. 22—The Harry B. Rummell Spark Plug Co. is building a manufacturing plant here, following the recent announcement that activities of the company would be moved from Findlay, Ohio, to this city. Production will be begun by September 1, according to Harry B. Rummell, president.

Forfeitures Under Revenue Act Upheld

Manufacturer, Holding Lien, Has No Claim on Rum Car

WASHINGTON, Aug. 21—The Circuit Court of Appeals for the Fourth Circuit has just rendered an opinion of vital interest to motor car manufacturers and finance companies, according to the text of the opinion filed this week with the Department of Justice.

The decision holds that an innocent holder of an unsatisfied money lien of an automobile, may not prevent forfeiture of a car used in the transportation of liquor where the enforcement officer proceeds under the revenue laws rather than under the national prohibition act.

In the case a prohibition officer halted a car, searched it, and found a quantity of liquor concealed therein. The occupants were placed under arrest. The District Attorney prosecuted the occupants of the car under Section 3296 of the Revised Statutes, which provides for punishment for persons found guilty of removal or concealment of liquor contrary to law and filed a libel against the car under Section 3450 of the Revised Statutes.

The manufacturing company intervened and upon an adverse decision of the lower court appealed to the Circuit Court of Appeals. In deciding that the rights of an innocent holder of an unsatisfied money lien of an automobile will not avail, the court distinguished the case from those in which prosecutions were made under the national prohibition act.

Lockheed's Sales Gaining

DETROIT, Aug. 19—The Lockheed Aircraft Corp. reports sales of $206,500 worth of aircraft in the first fifteen days after acquisition by the Detroit Aircraft Corp.

E. S. Evans, president of the Detroit Aircraft Corp., in announcing the sales figures, pointed out that volume of sales will be the aim of the new management, and that production methods which have made the automobile industry famous are to be applied in the plants of all Detroit Aircraft subsidiaries to make this possible. He indicated that definite announcement regarding future Lockheed production schedule may be made early in September.

Willys to Retire Bonds

TOLEDO, Aug. 19—Willys-Overland Co. will retire $1,000,000 of its 6½ per cent first mortgage bonds on Sept. 1 at $102 and accrued interest. This will reduce bonded debt of the company to $4,000,000. The bonds were floated in 1923 to consolidate bank loans and obligations of the company and have been retired in annual instalments through the National City Bank, trustee.

Ethyl Corp. Increases Standard, Reduces Cost

NEW YORK, Aug. 16—Ethyl Gasoline Corp. has increased the anti-knock standard and decreased the cost in ethyl fluid to refiners. The higher anti-knock value keeps pace with increased compression in motor cars, which is producing greater efficiency and economy, according to E. W. Webb, president of the corporation.

The new standard requires Ethyl gasoline to contain one-fourth of a cubic centimeter of tetraethyl more than at present required. The maximum amount allowed, however, is three centimeters as before.

The new price for ethyl fluid sold to refiners is four-tenths of a cent per cubic centimeter as compared with five-tenths in the past. The assessment charged by the corporation will be six-tenths of a cent per gallon as compared with seven-tenths of a cent in the past.

G. M. Export Increases

NEW YORK, Aug. 19 — General Motors overseas sales during the second quarter of the current year amounted to 93,979 cars as compared with 80,533 in the corresponding period of 1928. Total sales for the first half of the current year were 148,191 as compared with 137,470 for the corresponding period of last year, or an increase of 7.8 per cent.

Seek Color Coordination

WASHINGTON, Aug. 20 — British motor body builders have joined with dress goods manufacturers, boot and shoe manufacturers, and dyers' associations in the establishment of a permanent "Color Council" whose function it will be to determine, coordinate and propagate color tendencies, according to a report received this week from London by the United States Department of Commerce.

Ford Buys Ancient Postville Court

LINCOLN, ILL., Aug. 19—The old Postville courthouse, scene of many of Abraham Lincoln's lawsuits, has been bought by Henry Ford.

It was indicated that Mr. Ford intended moving the old courthouse to Detroit.

Franklin Buys General Die Casting of Reading

SYRACUSE, N. Y., Aug. 22—The business and equipment of the General Die Casting Co. of Reading, Pa., has been taken over by the Franklin Die Casting Corp. of Syracuse, pioneer in the die casting industry, and parent company of the H. H. Franklin Manufacturing Co., makers of the Franklin automobile. The General Die Casting Co. has been engaged chiefly in the manufacture of automobile body hardware.

Equipment at the Reading plant which is now being operated by the Franklin Die Casting Corp. will be moved to Syracuse at an early date. Expanding business and need for extra facilities is the reason given for the transaction by Franklin officials.

Caravan to Advertise Cars

WASHINGTON, Aug. 15—For the purpose of advertising Italian-built cars, the Automobile Club of Italy and various Italian automobile manufacturers are planning a tour to England to attend the Schneider Cup Races September 7. Visits to Calais and Paris will be made by the caravan. According to the report from Milan to the Department of Commerce, it is thought the projected caravan will be productive of favorable results.

Seiberling Will Plan Soviet Tire Factory

NEW YORK, Aug. 16—Seiberling Rubber Co. of Akron, Ohio, and the Soviet Rubber Trust through Amtorg Trading Corp., have entered into a contract in accordance with which the American firm will prepare the designs, plans and specifications for the construction of a new factory to be located in the Soviet Union, probably at Yaroslavl.

This factory is to have an output of 3100 automobile tires, 9000 bicycle tires and 480 motorcycle tires per seven-hour shift. Meanwhile, several Soviet workers will work in the Seiberling plant at Akron to study methods in this country. Two Soviet engineers will participate in the design of the factory.

Midland Steel Expanding

CLEVELAND, Aug. 14—The Midland Steel Products Co. has announced plans for speeding production of its four-wheel brakes following the appearance of the new popular-priced Hupmobile Six, which is equipped with the brake. To provide for these as well as for additional orders now in hand, Midland has under way a $500,000 expansion program at its Detroit plant.

Aero Meeting Place Changed

CLEVELAND, Aug. 14—The joint aeronautic meeting of the Society of Automotive Engineers and the Aeronautical Engineers and the Aeronautical Chamber of Commerce, Aug. 26, 27 and 28, will be held at the Hotel Statler here instead of at the Hotel Hollenden, as originally announced.

Timken Leases Cambridge Building

CAMBRIDGE, MASS., Aug. 14—The Timken-Detroit Co. of Mich. has leased for a term of years an entire building here, to be used as a warehouse.

Calendar of Coming Events

SHOWS

Automotive Exhibit, Canadian National Exhibition, Toronto ....Aug. 23-Sept. 7
Vienna Fair .....Sept. 1-8
International Aircraft Exhibit, Coliseum, Chicago .....Sept. 7-15
National Machine Tool Builders' Exposition and Congress, Cleveland, Sept. 30-Oct. 4
Paris, Automobiles .....Oct. 3-13
London, Automobiles .....Oct. 17-26
Prague, Automobiles .....Oct. 23-30
Paris, Motorcycles .....Oct. 23-Nov. 3
M.&E.A. Show and Convention, Chicago .....Nov. 4-9
N.S.P.A. Show and Convention, Detroit .....Nov. 11-16
Berlin Auto Salon .....Nov. 14
London, Trucks .....Nov. 7-16
Paris, Trucks .....Nov. 14-24
London, Motorcycles .....Nov. 30-Dec. 7
Brussels Auto Salon.....Dec. 7
New York National.....Jan. 4-11
Chicago National, Coliseum..Jan 25-Feb. 1
Cleveland Automobile Show..Jan. 25-Feb. 1

CONVENTIONS

Second Pan-American Congress of Highways, Rio de Janeiro.....Aug. 16-31
American Welding Society, Fall Meeting and Exposition, Cleveland....Sept. 9-12
American Institute of Mining and Metallurgical Engineers, Cleveland, Sept. 9-12
American Society for Steel Treating, Convention and Exposition, Cleveland .....Sept. 9-13
American Chemical Society, Fall Meeting, Minneapolis .....Sept. 9-13
A.S.M.E.—Iron and Steel Division—National Meeting, Cleveland....Sept. 9-13
Society for Electrical Development, New York City .....Sept. 13
Eastern States Exposition, Springfield, Mass. .....Sept. 15-21
American Electric Railway Association, Atlantic City .....Sept. 28-Oct. 4
National Industrial Advertisers Assn., Cincinnati .....Sept. 30-Oct. 2
National Safety Congress, Annual, Chicago .....Sept. 30-Oct. 4
Penna. Automotive Association, Erie, Pa. .....Oct. 7-8
Permanent International Association of Road Congresses, Sixth Session, Washington, D. C.....Oct. 7-11
Society of Industrial Engineers, Detroit .....Oct. 16-18
National Hardware Association, Atlantic City .....Oct. 21-24
Society of Industrial Engineers, Sixteenth Annual Meeting, Hotel Statler, Cleveland .....Oct. 23-25
Amer. Gear Mfrs. Asso., Phila...Oct. 24-26
World Engineering Congress, Tokio, Japan .....Oct. 29-Nov. 22
National Automotive Parts Association, Detroit .....Nov. 6-8
Highway Research Board, Ninth Annual Meeting, Washington, D. C. Dec. 12-13
National Automobile Dealers Association, New York City .....Jan. 6
American Roadbuilders Association, Atlantic City .....Jan. 11-18
National Automotive Dealers Association, Chicago .....Jan. 27-28

RACES

British Tourist Trophy Race.....Aug. 17
Cleveland .....Aug. 18
National Air Races and Show, Cleveland, Aug. 24-Sept. 2
European Grand Prix, Italy.....Aug. 31
Altoona, Pa. .....Sept. 2
Schneider Trophy (Aeronautical), Calshot, England .....Sept. 7
Syracuse .....Sept. 8
Toledo .....Sept. 15
Los Angeles .....Nov. 17

S. A. E.

Aeronautic Meeting, Cleveland..Aug. 26-28
Production Meeting, Cleveland.....Oct. 2-4
Transportation Meeting, Toronto.Nov. 12-15
Annual Meeting, Detroit.....Jan. 21-24

SALONS

Hotel Drake, Chicago .....Nov. 9-16
Hotel Commodore, New York City.Dec. 1-7
Hotel Biltmore, Los Angeles.....Feb. 8-15
Palace Hotel, San Francisco, Feb. 22-Mar. 1